## DEPARTMENT OF THE AIR FORCE

## RDT&E DESCRIPTIVE SUMMARIES FOR

FY 2001 PRESIDENT'S BUDGET

VOLUME IIA



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**FEBRUARY 2000** 

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#### Fiscal Year 2001 Budget Estimate Submission RDT&E Descriptive Summaries, Volume II February 2000

## INTRODUCTION AND EXPLANATION OF CONTENTS

- (RDT&E) program elements and projects in the FY2001 President's Budget Submission (PB). All formats in this document are in accordance with the guidelines of 1. (U) GENERAL. This document has been prepared to provide information on the United States Air Force (USAF) Research, Development, Test and Evaluation the DoD Financial Management Regulation, Volume 2B, Chapter 5 with the exception of the R-3 exhibit. The Air Force could not support the format matrix because our programs do not track their programs in the manner required to complete the exhibit.
- of the Congressional committees insofar as possible. The F-22 "P-5" budget exhibit directed by the Authorization Conference Report number 106-371 Contents: Exhibits R-2, R-2a and R-3 provide narrative information for all RDT&E program elements and projects within the USAF FY 2001 RDT&E program except the classified program elements. The formats and contents of this document are in accordance with the guidelines and requirement has been inserted behind the R-3 exhibit for program element 0604239F. æ.
- Construction appropriation funds on specific development programs, Operations and Maintenance appropriation funds where they are essential to The "Other Program Funding Summary" portion of the R-2 includes, in addition to RDT&E funds, Procurement funds and quantities, Military the development effort described, and where appropriate, Department of Energy (DOE) costs. ۻ.
  - The Justification book has been assembled in accordance with DoD Financial Management Regulation 7000.14, Vol. 2B Cpt 5, Sec 050302 with the exception of the R-1; Project Funding Listing which was distributed under a separate cover due to classification. ပ

### 2. (U) CLASSIFICATION.

a. All exhibits contained in Volumes I, II and III are UNCLASSIFIED. Classified exhibits are not included in the submission due to the level of security classification and necessity of special security clearances.

## INTRODUCTION AND EXPLANATION OF CONTENTS

Program Element	Remarks
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BUDGET ACTIVITY 2: APPLIED RESEARCH	
0602202F, Human Effectiveness Applied Research	Project 6219 was terminated after FY 1999, but Congress added funding in FY 2000.
0602269F, Hypersonic Technology Program	Project 1025 funding for this program in FY01 is contained in PEs 0602023F Aerospace Propulsion, 0603203F Aerospace Propulsion Subsystems Integration and 0603216F Aerospace Propulsion and Power Technology.
0602601F, Space Technology	Project 1011 all rocket propulsion efforts will be transferred to 0602203F, Project 4847. Project 3326 all lasers and imaging efforts will be transferred to PE 0602605F, Projects 4866 and 4867.
0602605F, Directed Energy Technology	Projects 4866 and 4867 were transferred from PE 0602601F.
0602702F, Command, Control and Communications	Project 4506, Surveillance Technology will be transferred to Project 4594, PE 0602702F and Project 7622, PE 0602204F beginning in FY01.

# BUDGET ACTIVITY 3: ADVANCED TECHNOLOGY DEVELOPMENT

0603726F, Aerospace Information Technology Systems	In FY 2001, the efforts in Project 632863, Integrated Photonics, will be
Integration	conducted in PE 0603203F, Project 63665A. Prior to
	FY 2001, the efforts in Project 634850, Collaborative C2, were
	performed in PE 0603253F, Projects 632735 and 63666A.

# BUDGET ACTIVITY 4: DEMONSTRATION AND VALIDATION

SBIRS Low efforts performed in Project 0007 will be transferred to PE 0604442F, Project 4598 in FY00 and 01.	Project 2025 will complete in FY01.
0603441F, Space Based IR Arch (Dem/Val)	0603800F. Joint Strike Fighter

## INTRODUCTION AND EXPLANATION OF CONTENTS

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0603854F, Wideband Milsatcom	Project 4870 is a FY01 new start.
0603856F, Air Force/NRO Partnership	Project 4782, the Air Force/National Program Cooperation (AFNPC) effort is a FY01 new start.
0603859F, Pollution Prevention	Project 4852, Pollution Prevention will be transferred from PE 0605854F, previously in Budget Activity 6 beginning in FY01.
BUDGET ACTIVITY 5: ENGINEERING AND MANUFACTURING DEVELOPMENT	ICTURING DEVELOPMENT
0207249F, Precision Attack Systems Procurement	Project 2693 is a FY01 new start.
0604012F, Joint Helmet Mounted Cueing System	Project 4789 the Joint Helmet Mounted Cueing Systems effort is a FY01 new start.
0604201F, Integrated Avionics Planning and Development Project 2257 will complete in FY01.	Project 2257 will complete in FY01.
0604270F, EW Development	Project 8462 is a FY01 new start.
0604602F, Armament Ordnance Development	Project 3133 will complete in FY01.
0604327F, Hardened Target Munitions	Project 4641 will complete in FY00.
0604617F, Agile Combat Support	Project 2895 will complete in FY01.
0604706F, Life Support System	Project 412A, the K-36/3.5A Ejection Seat effort is a FY01 new start.
0604754F, Joint Tacital Information Distribution System	Project 4749, the Air Defense System Integrator effort is a FY01 new start
0604851F, ICBM	Project 4210 completes in FY00.

Project 3321, Joint Modeling and Simulation System (JMASS) funding

BUDGET ACTIVITY 6: MANAGEMENT AND SUPPORT

0604256F, Threat Simulator Development

and responsibility transferred in FY00 to PE 0207601F.

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Program Element	Remarks
BUDGET ACTIVITY 6: MANAGEMENT AND SUPPORT Continued	UT Continued
0604256F, Threat Simulator Development	Project 7500, Foreign Materiel Acquisition and Exploitation (FMA/E) established a funding line in FY00.
0605808F, Development Planning	PE terminated in FY00.
0604759F, Major T&E Investment	Project 4759, two I&M projects started in FY00: Modeling & Simulation T&E Resources (MASTER); and Seeker T&E.
0604759F, Major T&E Investment	Project 4759, the Advanced Range Telemetry Integration (ARTM) was developed by CTEIP (OSD PE 0604940D). The ARTM I&S (Integration and Support) funding in this PE begins in FY01. Integrates the OSD developed ARTM into the Edwards AFB range.
0605854F, Pollution Prevention	Program moved into Budget Activity 4, to PE 0603859F beginning in FY01.
BUDGET ACTIVITY 7: OPERATIONAL SYSTEM DEVELOPMENT	ELOPMENT
0101120F, Advanced Cruise Missile	Project 4798, the AGM-129A Advanced Cruise Missile Service Life Extension Program effort is a FY01 new start.
0207133F, F-16 Squadrons	Project 2671, the Automated Ground Collision Avoidance system, Falcon Star, and Targeting Pod/HARM Targeting Systems efforts are FY01 new starts.
0207141F, F-117A Squadrons	Project 3956, the F-117 Enhanced GBU-27 effort is a FY01 new start.
0303140F, Information Systems Security Program	Project 4585, Cryptologic 2020, will be funded under PE 33401F, Comm Sec, Project 4861, Cryptologic 2020, beginning in FY01.
0303601F, Milsatcom Terminals	Project 2487, the Airborne Wideband Terminal and Ground Multiband Terminal effort are a FY01 new start.
0305205F, Endurance Unmanned Aerial Vehicles	Project 4883 is a FY01 new start. Project 4816 will merge into 4799 in FY00.

## INTRODUCTION AND EXPLANATION OF CONTENTS

Remarks	
Program Element	

BUDGET ACTIVITY 7: OPERATIONAL SYSTEM DEVELOPMENT Continued

Project 4882 is a FY01 new start. 0305206F, Airborne Reconnaissance System

Project 4820 will be transferred to PE 0305202F beginning in FY01. 0305207F, Manned Reconnaissance system

Project 4791, the Ground-Based Electro-Optical Deep Space

Surveillance Sustainment effort is a FY00 new start.

Project 4885 is a FY01 new start.

0401115F, C-130 Airlift Squadrons

0305910F, Spacetrack

0401130F, C-17 Aircraft

Project 4886 is a FY01 new start.

FY01 funding was moved to this PE from PE 0708611F, Project 67309. Project 4860 is a FY01 new start. 0708612F, Computer Resources Support Improvement 0404011F, Special Operations Forces

Project 0002, the Project Definition of NATO Advanced Trans Atlantic 1001018F, NATO Joint Stars Program

Radar Project effort is a FY01 new start pending Congressional

approval.

PE NUMBER: 0603260F

PE TITLE: Intelligence Advanced Development

	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
BUDGET ACTIVITY 04 - Demons	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603260F Intelli	AND TITLE F Intelli	gence Ac	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	Develop	ment	
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	3,819	4,498	4,401	4,455	4,543	4,634	4,726	Continuing	TBD
643479	Advanced Sensor Exploitation	814	797	6//	816	816	833	848	Continuing	TBD
643480	643480 Automated Imagery Exploitation	775	1,287	1,256	1,313	1,311	1,338	1,364	Continuing	TBD
643481	Knowledge Based Tech For Intelligence	1,118	1,313	1,287	1,343	1,352	1,378	1,407	Continuing	TBD
643482	Science & Tech Intelligence Methodology	1,112	1,101	1,079	983	1,064	1,085	1,107	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

### (U) A. Mission Description

(U) Intelligence Advanced Development (IAD) demonstrates and validates advanced technology required to support warfighter needs for timely all source intelligence evolutionary approach, integrating finished modules directly into the field. The programs are oriented toward specific shortfalls and deficiencies as documented by the major commands (MAJCOMS), unified commands, and intelligence organizations in their mission and function area plans. The goal of this program is to expedite projects provide better on-time information to the warfighter using new and existing data sources, streamline data analysis, reduce footprint required, extend life of technology transition from the laboratory to operational use via rapid prototyping. This AF program is focused on technology insertion to correct AF intelligence information. IAD research supports global awareness, consistent battlespace knowledge, precision information, and the execution of time critical missions. IAD sensors in place and enhance performance. Air Force Research Lab Rome Research Site (AFRL/IFE) works directly with users, employing a rapid prototyping deficiencies at tactical or operation levels. This program bridges the transition of Advance Technology Demonstrations (ATDs), Integrated Technology Thrust Programs (ITTPs), and supports Defense Technology Objectives (DTOs).

## (U) B. Budget Activity Justification

This program is in Demonstration and Validation, Budget Activity 4, because it demonstrates and validates advanced technology which enhances information / intelligence systems capabilities and techniques.

Page 1 of 18 Pages

Exhibit R-2 (PE 0603260F)

PERMANSER AND TITLE		RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SATION SHEET (R-2 Exhib	oit)	DATE <b>Februa</b>	February 2000
EV 1929   EV 2000   EV 200   EV 2000   EV 20	80D <b>04</b>	ET ACTIVITY <b>Demonstration and Validation</b>	PE NUMBER AND TITLE 0603260F Intelligen	ce Advanced	Development	
Previous President's Budget (FY 2000 PBR) 4,602 4,534 4,446  Appropriated Value	9	C. Program Change Summary (\$ in Thousands)	FV 1999	FY 2000	FV 2001	Total Cost
Adjustments to Appropriated Value  Adjustments to Appropriated Value  a. Congressional/General Reductions b. Small Business Innovative Research c. Ominbus or Other Above Threshold Reprogram c. Rescissions f. Other  Adjustments to Budget Years Since FY 2000 PBR Significant Program Changes:  None  Page 2 of 18 Pages  Adjustments Approgram  Page 2 of 18 Pages	9	Previous President's Budget (FY 2000 PBR)	4,602	4,534	4,442	TBD
a. Congressional/General Reductions b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions f. Other Adjustments to Budget Years Since FY 2000 PBR Significant Program Changes: None  Page 2 of 18 Pages	99	Appropriated Value Adiustments to Appropriated Value	4,615	4,534		
b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram -637 e. Rescissions f. Other Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR Significant Program Changes: None Page 2 of 18 Pages		a. Congressional/General Reductions	-13			
c. Omnibus or Other Above Threshold Reprogram  d. Below Threshold Reprogram  e. Rescrissions  f. Other  Adjustments to Budget Years Since FY 2000 PBR  Significant Program Changes:  None  Page 2 of 18 Pages		b. Small Business Innovative Research	-125			
Current Budget Years Since FY 2000 PBR Adjustments to Budget Years Since FY 2000 PBR Significant Program Changes:  None  Page 2 of 18 Pages		c. Omnibus or Other Above Threshold Reprogram		-36		
Adjustments to Budget Years Since FY 2000 PBR Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR Significant Program Changes: None Page 2 of 18 Pages		d. Below Infestiona Reprogram  Rescrissions	-63/ -21			
Adjustments to Budget Years Since FY 2000 PBR  Current Budget SubmitFY 2001 PBR  Significant Program Changes:  None  Page 2 of 18 Pages		f. Other				
Current Budget Submit/FY 2001 PBR  Significant Program Changes:  None  Page 2 of 18 Pages	9	Adjustments to Budget Years Since FY 2000 PBR			4	
Significant Program Changes:  None  Page 2 of 18 Pages	9	Current Budget Submit/FY 2001 PBR	3,819	4,498	4,401	TBD
Page 2 of 18 Pages	9	Significant Program Changes:				
		None				
						<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>
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			rage 2 of 18 rages		) 7-X ligiux=	(PE UDUSZBUF)

	RDT&E	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFICA	VTION S	SHEET (	R-2A E	xhibit)		DATE	Februa	February 2000
BUDG <b>04</b> -	вирсет астіліту 04 - Demonstration and Validation	d Validation			PE NUMBER AND TITLE 0603260F Intelli	AND TITLE	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	lvanced	Develop	ment	PROJECT <b>643479</b>
	COST (\$ in Thousands)	nousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
643479	9 Advanced Sensor Exploitation	oitation	814	797	677	816	816	833	848	Continuing	TBD
(£)	A. Mission Description The project objectives ar techniques for the receipt allowing for the greatest of intelligence informatic with current manual met battle updates and tactica including COMINT, ELI	A. Mission Description  The project objectives are to develop, demonstrate and evaluate a near-real-time all source correlation/fusion capability by applying state-of-the-art data processing techniques for the receipt, correlation, templating and analysis of battlefield information. Capabilities will be developed in open systems architecture environment allowing for the greatest efficiency in terms of integrating or interfacing with other systems. There is an Air Force, DoD and Coalition need to correlate various sources of intelligence - IMINT) within seconds as opposed to hours with current manual methods. Project includes development of data correlation and predictive intelligence algorithms, target analysis and prioritization, air order of battle updates and tactical analysis techniques. This computerized approach will speed up the correlation of data from diverse sources of intelligence information, including COMINT, ELINT, and IMINT; providing faster situational awareness and threat assessment and replace manual systems with automated capabilities	d evaluate a lanalysis of lanalysis of lating or interence - COMI opment of da computerized faster situatio	near-real-tir battlefield ir facing with NT, Electro ta correlation approach v	me all source aformation. other system onic Intellige on and predii will speed up	correlation Capabilities is. There is nce - ELIN tive intellig the correlat	fusion capal will be deve an Air Force f, Image Intence algorith ion of data ft and replace t and replace	bility by appeloped in oposition of the state of the stat	olying state-en systems a Coalition nee MINT) with unalysis and sources of items with an entern	devaluate a near-real-time all source correlation/fusion capability by applying state-of-the-art data processing analysis of battlefield information. Capabilities will be developed in open systems architecture environment ting or interfacing with other systems. There is an Air Force, DoD and Coalition need to correlate various so once - COMINT, Electronic Intelligence - ELINT, Image Intelligence - IMINT) within seconds as opposed to opment of data correlation and predictive intelligence algorithms, target analysis and prioritization, air order of omputerized approach will speed up the correlation of data from diverse sources of intelligence information, aster situational awareness and threat assessment and replace manual systems with automated capabilities	a processing environment ie various sources sopposed to hours 1, air order of nformation, abilities
99999	EY 1999 (\$ in Thousands) \$398 Cor \$198 Cor \$218 Cor \$814 Tot	ids) Completed Consistent Operational Picture Via Distributed Fusion for Global Awareness. Completed Enhanced Analytical Tools to Support Dynamic Situation Awareness. Completed Predictive Fusion Algorithms to Support Dynamic Planning and Execution. Total	onal Picture ' al Tools to S Algorithms to	Via Distribu upport Dyn: Support Dy	ıted Fusion f amic Situati ynamic Plan	or Global A on Awarene ning and Ex	wareness. ss. ecution.				
99999	FY 2000 (\$ in Thousands) \$210 Init \$194 Init \$393 Init \$797 Tot	Indexity Indexists of Information Fusion to support Dynamic Planning and Execution. Initiate Data Fusion Architecture for Global Awareness. Initiate Consistent Battlespace Picture Build II to support Dynamic Planning and Execution Total	mation Fusio tre for Globa Picture Buil	n to support I Awareness d II to suppo	nation Fusion to support Dynamic Planning and Execution. re for Global Awareness. Picture Build II to support Dynamic Planning and Execution.	lanning and Planning an	Execution. Id Execution				
99999	EY 2001 (\$ in Thousands) \$393 Cor \$193 Cor \$193 Cor \$779 Tot	nds) Complete Network Centric Information to Support Dynamic Planning and Execution. Continue Data Fusion Architecture for Global Awareness. Continue Consistent Battlespace Picture Build II to support Dynamic Planning and Execution. Total	ormation to Struce for Glol	Support Dyr bal Awarene uild II to suj	namic Planni ess. pport Dynan	ing and Exec nic Planning	oution. and Executi	.uo			-
Ą	Project 643479			Page	Page 3 of 18 Pages	δ		:	Ä	hibit R-2A (	Exhibit R-2A (PE 0603260F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (F	-2A Exh	ibit)	DATE	E February 2000	2000
13 <b>4</b>	вирсет астилту <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603260F Intelli	ND TITLE Intelliger	nce Advan	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	pment	PROJECT <b>643479</b>
Ð	B. Project Change Summary Not Applicable						
9	C. Other Program Funding Summary (\$ in Thousands)  FY 2000  FY 2000  Actual Fertinate Fertinate	FY 2002 Fertimate	FY 2003 Ferimate	FY 2004 Fetimate	FY 2005 Fertimate	Cost to	Total Cost
9	RELATED ACTIVITIES 62720F C31 Exploratory Development: information exploitation 63789F C3 Advanced Technology Development: correlation, fus 63726F C3 Subsystem Integration: advanced information applice 64750F Intelligence Equipment: modeling and simulation, foreign	deo/text), multi ns, visualizatic ced memory te ssment.	sensor collab n. chnology.	oration, global	information ba	Se.	
	31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).	Systems (DoD)	IS).				
9	<b>D. Acquisition Strategy</b> All major contracts within this Program Element were awarded after full and open competition.	ypen competition	'n.				
<u>e</u>	E. Schedule Profile	FY 1999	4	EX 2000	000 4	FY 2001	00 <u>1</u>
<u> </u>	Consistent Operational Picture, Via Distributed Fusion Completed Enhanced Analytical Tools Completed Predictive Fusion Algorithms Completed Network Centric Information Fusion Initiated Data Fusion Architecture Initiated Consistence Battlespace Picture Build II Initiated * - Denotes completed event X - Denotes planned event		t * * *	N		· ×××	
	Project 643479	Page 4 of 18 Pages			_	Exhibit R-2A (PE 0603260F)	: 0603260F)

	RDT&E PROGRAM ELEMENT	AM ELE		/PROJECT COST BREAKDOWN (R-3)	OST BI	₹EAKDO\	WN (R-3)		DATE <b>F</b> (	February 2000	00
BUD. <b>04</b>	вирсет астилту 04 - Demonstration and Validation	lidation			PE NUMB <b>060326</b>	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	ence Adv	anced De	velopmer		РРОЈЕСТ <b>643479</b>
(J)	A. Project Cost Breakdown (\$ in Thousands)	in Thousand	<b>S</b>				FV 1000	000	EV 2000	00	FV 2001
99	Consistent Operational Picture via Distributed Fusion Enhanced Analytical Tools	via Distribute	l Fusion				]	398 198		3	1
£33	Predictive Fusion Algorithms Network Centric Information Fusion	noist						218	210	043	193
33	Consistent Battlespace Picture Build II Total	suna m						814	393 797	7	193 779
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	and Plannin	g Information	(S in Thousand	ত্ত						
9	Performing Organizations: Contractor or	Contract									
		Method/Type or Funding	Award or Obligation	Performing Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total.
	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	<b>EY 2000</b>	FY 2001	Complete	Program
	Product Development Organizations Electic Computing Concepts CPFF	ions PFF				350	398	210	0	Continuing	TBD
	96-C-0045									1	
	97-C-0341	CPFF				100	198	194	0	Continuing	TBD
	BTG, Inc CI 97-C-0341	CPFF				0	218	393	393	Continuing	TBD
	TBD	TBD				0	0	0	193	Continuing	TBD
	Contractor TBD TI	TBD				0	0	0	193	Continuing	TBD
	Support and Management Organizations N/A	izations									
	Test and Evaluation Organizations	SU									
	N/A										
Δ.	Project 643479			Page	Page 5 of 18 Pages	ges			Exhib	Exhibit R-3 (PE 0603260F)	303260F)

RDT&E PROGRAM ELEMENT/PROJECT	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	e
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	ence Adva	anced Dev	/elopmen		РРОЈЕСТ <b>643479</b>
(U) Government Furnished Property:  Contract Method/Type Award or Item or Funding Obligation Delivery Description Vehicle Date Product Development Property N/A Support and Management Property Test and Evaluation Property	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
Subtotals Subtotal Product Development Subtotal Support and Management	<u>Total Prior</u> to <u>FY 1999</u> 450	Budget FY 1999 814	Budget FY 2000 797	Budget FY 2001 779	Budget to Complete TBD	Total Program TBD
Subtotal Test and Evaluation  Total Project	450	418	797	779	TBD	TBD
Project 643479	Page 6 of 18 Pages			Exhibi	Exhibit R-3 (PE 0603260F)	3260F)

	RDT&E BUDGET ITEM JUSTIFICATION	JSTIFIC/	VTION 8	SHEET (	SHEET (R-2A Exhibit)	xhibit)		DATE		February 2000
8UDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER 0603260	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	gence Ac	dvanced	Develop	ment	PROJECT <b>643480</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
643480	0 Automated Imagery Exploitation	775	1,287	1,256	1,313	1,311	1,338	1,364	Continuing	TBD
Ð	A. Mission Description This project demonstrates and validates the capability to more accurately and quickly interpret digital imagery and video by evaluating computer assisted techniques to manipulate and overlay imagery, cartographic data, signal intelligence (SIGINT), and on line intelligence data. The result of this effort will be more precise target locations and identifications, precise target reference scenes, and more accurate damage assessments; all developed for easy supportability on low cost commercially available computer workstations	y to more acc signal intellig scenes, and	urately and ence (SIGIN	quickly inte VT), and on te damage a	rpret digital line intellige ssessments;	imagery and nce data. Ti all develope	l video by e' he result of 1 d for easy sı	valuating co this effort w upportability	mputer assisi ill be more p 7 on low cost	ted techniques to recise target commercially
555555	\$264 Completed Multi-Processor developmentfor Automated Image Exploitation. \$189 Completed Speech Technology for Image Exploitation. \$189 Completed Techniques for Secure Image Information Dissemination - Secure Steganography. \$161 Continued Distributed Imagery Information Systems Integration in support of Information Su	evelopmentfe sy for Image i cure Image Ii ry Informatio	r Automate Exploitation nformation I n Systems In	d Image Ext  Dissemination  ntegration in	elopmentfor Automated Image Exploitation. for Image Exploitation. ire Image Information Dissemination - Secure Steganography. Information Systems Integration in support of Information Superiority (Phase 2).	iteganograph nformation	hy. Superiority	(Phase 2).		
5555	FY 2000 (\$ in Thousands) \$856 Continue Distributed Imagery Information Systems Integration in support of Information Superiority (Phases 3, 4, and 5). \$431 Initiate Multi-Spectral/Hyper Spectral Image Exploitation Applications \$1,287 Total	/ Information Spectral Ima	Systems Intge Exploitat	egration in s ion Applicat	support of In tions	formation S	uperiority (J	Phases 3, 4,	and 5).	
5666	FY 2001 (\$ in Thousands)  \$867 Complete Distributed Imagery Information Systems Integration in support \$389 Continue Multi-Spectral / Hyper-Spectral Image Exploitation Applications \$1,256 Total	y Informatior per-Spectral	Systems In mage Explc	tegration in itation App	Information Systems Integration in support of Information Superiority (Phases 3, 4, and 5). r-Spectral Image Exploitation Applications.	aformation S	Superiority	(Phases 3, 4	, and 5).	
9	B. Project Change Summary Not Applicable									
Ą.	Project 643480		Page	Page 7 of 18 Pages	Sə			Û	xhibit R-2A	Exhibit R-2A (PE 0603260F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (	R-2A Exh	ibit)	/Ω	DATE Fahrii	February 2000	
800 <b>94</b>	nd Validation	PE NUMBER AND TITLE 0603260F Intelli	AND TITLE F Intellige	nce Advan	PE NUMBER AND TITLE  0603260F Intelligence Advanced Development	opment	PROJECT <b>643480</b>	ст <b>80</b>
(£)		FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Tot	Total Cost
<u> </u>	Related Activities: 62720F C31 Exploratory Development: information exploitation (imagery / video / text), multi-sensor collaboration, global information base. 63789F C3 Advanced Technology Development: correlation, fusion algorithms, visualization. 63726F C3 Subsystem Integration: advanced imagery/information applications, advanced memory technology. 64750F Intelligence Equipment: modeling and simulation, foreign threat assessment. 31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).	/ video / text), m thms, visualizati ions, advanced i ssessment. n Systems (DoD	nulti-sensor colion. memory technorits).	laboration, glc ology.	obal informatio	n base.		
9	<b>D. Acquisition Strategy</b> All major contracts within this Program Element were awarded after full and open competition.	nd open competi	tion.					
9	E. Schedule Profile	FY 1999 2 3	4	FY 2	FY 2000 2 3 4	1 Z	FY 2001 2 3	4
55555	us for Automated Image Exploitation Completed blogy for Image Exploitation Completed information Dissemination Completed / Hyper Spectral Image Applications Initiated agery Information System Complete mpleted event anned even	*	* *	*				×
	Project 643480 Pa	Page 8 of 18 Pages	S			Exhibit R-2A	Exhibit R-2A (PE 0603260F)	0F)

	RDT&E PROGRAM ELEMENT	AM ELE	MENT/PR	I/PROJECT CO	OST BF	COST BREAKDOWN (R-3)	VN (R-3)	:	DATE F	February 2000	00
BUE <b>04</b>	вирсет астіліту 04 - Demonstration and Validation	idation			PE NUMBER AN <b>0603260F</b>	PE NUMBER AND TITLE 0603260F Intellig	ence Adv	ND TITLE Intelligence Advanced Development	velopmer	:	РRОЈЕСТ <b>643480</b>
(c)	A. Project Cost Breakdown (\$ in Thousands)	in Thousand	(জ				0001 23	000	0000 25	0	EV 2001
99	Multi Processor for Automated Image Exploitation Speech Technology for Image Exploitation	lmage Exploi xploitation	tation					264 189	7	∄	7007
<u> </u>		mination 1 System Inte Image Exploi	gration tation Applicati	ons			•	161 161 775	856 431 1,287	66 11 37	867 389 1,256
<u> </u>	B. Budget Acquisition History and Planning Information (\$ in Thousands)	and Plannin	g Information	(S in Thousands	a						
9	Performing Organizations:										
	Contractor or Co	Contract Method/Type	Award or	Performing	Project						
	Performing or	or Funding	Obligation Pete	Activity	Office	Total Prior	Budget EV 1000	Budget EV 2000	Budget EV 2001	Budget to	Total
	Development Organiz	ions	Tall	762	3	WF1 1332	1722	77 7000	1007 13	anaidino	LIOSIAIN
	Nichols Research 96-C-0083 CPFF	PFF	May 96			0	264	0	0	Continuing	TBD
	State University of New York CPFF	PFF	Jun 96			0	161	0	0	Continuing	TBD
	ıton	ļ				•		,	,		
	97-C-0105 CP PAR. Inc. CP	CPFF CPFF	Feb 98 Jun 98			00	189	0 429	0	Continuing Continuing	TBD
	٠,									0	
	PAR, Inc.	TBD	TBD			0	0	431	389	Continuing	TBD
	State University of New York TBD	ЗД	TBD			0	0	230	189	Continuing	TBD
	at Binghamton										
	Synectics TE	TBD	TBD			0	0	197	197	Continuing	TBD
	Support and Management Organizations N/A	izations									
_	Test and Evaluation Organizations N/A	SO									
	Project 643480			Page	Page 9 of 18 Pages	ges			Exhib	Exhibit R-3 (PE 0603260F)	03260F)

RDT&E PROGRAM ELEMENT/P	/PROJECT COST BREAKDOWN (R-3)	KDOWN (R	-3)	DATE <b>Fe</b>	February 2000	9
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelli	PENUMBER AND TITLE 0603260F Intelligence Advanced Development	dvanced De	velopmen		РКОЈЕСТ <b>643480</b>
(U) Government Furnished Property:  Contract  Method/Type Award or  Item or Funding Obligation Description Vehicle Date Product Development Property  N/A Support and Management Property  N/A	Delivery Total Prior Date to FY 1999	Prior Budget 1999 FY 1999	et <u>Budge</u> t 19 EY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
Test and Evaluation Property  N/A  Subtotals  Subtotal Product Development  Subtotal Support and Management Subtotal Test and Fvaluation	Total Prior to FY 1999	Prior Budget 1999 FY 1999 0 775	Et <u>Budget</u> 29 <u>FY 2000</u> 5 1,287	Budget EY 2001 1,256	Budget to Complete TBD	Total Program TBD
Total Project		0 777	5 1,287	1,256	TBD	ТВО
Project 643480	Page 10 of 18 Pages			Exhibi	Exhibit R-3 (PE 0603260F)	3260F)

	RDT&E	RDT&E BUDGET ITEM JUS	STIFIC/	TIFICATION SHEET (R-2A Exhibit)	неет (	R-2A E	xhibit)		DATE	February 2000	y 2000
BUDC <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation	ind Validation			PE NUMBER AND TITLE 0603260F Intelli	R AND TITLE	gence Ac	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	Develop	ment	PROJECT <b>643481</b>
	COST (\$ in	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
643481	31 Knowledge Based Tech For Intelligence	ech For Intelligence	1,118	1,313	1,287	1,343	1,352	1,378	1,407	Continuing	TBD
(D)	A. Mission Description This project will improv commands on AF intelli and effectiveness derive	e Global Awareness, gence organizations. d will provide warnin	ic Planning a velopment of and accuracy	ind Executio f the analytic , allowing na	n, providing al aids is ba ational/milit	g knowledge sed on artifi ary authoriti	bases and ir cial intellige es a greater	aference eng ence techniq range of opt	ines to expl ues. The incions to aver	oit collected or creased timel	Dynamic Planning and Execution, providing knowledge bases and inference engines to exploit collected data to nine major The development of the analytical aids is based on artificial intelligence techniques. The increased timeliness, efficiency g time and accuracy, allowing national/military authorities a greater range of options to avert, diminish or control a crisis.
555555	EY 1999 (\$ in Thousands) \$242 Cor \$274 Cor \$307 Cor \$295 Cor \$1,118	ompleted Enhancing Intelligence Analysts Productivity at AIA.  Completed Enhancing Intelligence Analysts Productivity at AIA.  Continued Machine Learning Prototype, expert system and neural network technologies to support real-time analysis of timelines. Continued Multimedia for Information Access for warfighters and analysts at AIA and users of Imagery. Continued Intelligence Application Browser Interfaces for warfighters and analysts at ACC and AIA.  Total	ence Analyst Prototype, ex ormation Acc ation Browse	s Productivi pert system cess for warf r Interfaces	ty at AIA. and neural 1 ighters and 3 for warfight	network tech analysts at A ters and anal	nologies to JA and user ysts at ACC	support real: s of Imager: and AIA.	-time analys y.	is of timeline	s <del>i</del>
99999	FY 2000 (\$ in Thousands) \$488 Coi \$488 Coi \$337 Coi \$1,313	ids) Complete Machine Learning Prototype, expert system and neural network technologies to support real-time analysis of timelines. Continue Multimedia for Information Access for analysts at AIA and users of Imagery. Continue Intelligence Application Browser Interfaces for warfighters and analysts at ACC and AIA. Total	rototype, exprantion Accetion Browser	pert system ass for analys Interfaces f	and neural n sts at AIA aı or warfighte	etwork techn nd users of I rrs and analy	nologies to s magery. sts at ACC a	upport real- and AIA.	time analysi	s of timeline	, á
99999	FY 2001 (\$ in Thousands) \$488 Cor \$488 Cor \$311 Init \$1,287 Tot	ids) Complete Multimedia for Information Access for analysts at AIA and users of Imagery. Continue Intelligence Application Browser Interfaces for warfighters and analysts at ACC and AIA. Initiate Secure Information Delivery by developing a Broadsword trusted transfer agent. Total	rmation Acc tion Browser livery by dev	ess for analy Interfaces f veloping a B	sts at AIA a or warfighte roadsword t	nd users of Trs and analy rrusted transi	magery. sts at ACC a	and AIA.			
<u> </u>	B. Project Change Summary Not Applicable	mmary									
Ā	Project 643481			Page 1	Page 11 of 18 Pages	ses			Û	thibit R-2A (	Exhibit R-2A (PE 0603260F)

	RDT&E BUDGET ITEM JUS	JUSTIF	ICATION	SHEET (	TIFICATION SHEET (R-2A Exhibit)	libit)		DATE Februs	February 2000
В Д <b>8</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603260F Intelli	AND TITLE  F Intellige	PENUMBER AND TITLE  0603260F Intelligence Advanced Development	ced Dev	elopment	PROJECT 643481
<b>E E</b>	C. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000  Actual Estimate  Related Activities:	housands) EY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
,	62720F C3I Exploratory Development: information exploitation (imagery/video/text), multi-sensor collaboration, global information base. 63789F C3 Advanced Technology Development: correlation, fusion algorithms, visualization. 63726F C3 Subsystem Integration: advanced information technology, advanced memory technology. 64750F Intelligence Equipment: modeling and simulation, foreign threat assessment.	tion exploitat : correlation, formation tecl	ion (imagery/v fusion algoritl mology, advar reign threat ass	ideo/text), mu hms, visualizat teed memory t sessment.	lti-sensor colla ion. echnology.	boration, glob:	ıl informatioı	ı base.	
		oD Intelligen≀	e Information	Systems (DoL	MIS).				
9	D. Acquisition Strategy All major contracts within this Program Element were awarded after full and open competition.	t were award	ed after full and	d open compet	ition.				
<u>e</u>	E. Schedule Profile		_	FY 1999 2 3	4	EY 2	FY 2000 2 3 4	-	FY 2001 2 3 4
<u> </u>	<ul> <li>(U) Enhancing Intelligence Analysts Productivity Completed</li> <li>(U) Machine Learning Prototype Complete</li> <li>(U) Multimedia Information Access Complete</li> <li>(U) Secure Information Delivery Initiated</li> <li>* - Denotes completed event</li> <li>X - Denotes planned event</li> </ul>	y Completed			*		×	M	*
	Project 643481		Page	Page 12 of 18 Pages	S			Exhibit R-2A (	Exhibit R-2A (PE 0603260F)

	RDT&E PROGRAM ELEMENT	RAM ELE		'PROJECT COST BREAKDOWN (R-3)	OST BRI	EAKDOV	VN (R-3)		DATE <b>Fe</b>	February 2000	8
8UD <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	alidation			PE NUMBER AND TITLE 0603260F Intelli	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	ence Adva	anced Dev	relopmen		PROJECT <b>643481</b>
<u>(c)</u>	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousan	ds)				EV 1000	000	000C XII		EV 2001
56	Enhancing Intelligence Analysts Productivity Machine I earning Prototyne	ysts Productivi	ţ <b>t</b>					242 274	488	ə	7007
<u> </u>	Multimedia for Information Access Intelligence Applications Browser Interfaces	Access owser Interface	ý				1 60 6	307	488		488
333	Secure Information Delivery Total		ş				, [,1	1,118	1,313		311
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannir	ng Informatio	n (S in Thousand	(SI						
9	Performing Organizations: Contractor or	Contract									
	Serior Methor Methor Performing or Fur Activity Vehic	Method/1ype or Funding Vehicle	Award or Obligation Date	Pertorming Activity EAC	Project Office EAC 1	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total.</u> Program
	GTE 96-C-0085 Booz Allen 96-C-0092	CPFF CPFF	May 96 Jun 96			200	274	488		Continuing	TBD
	97-C-0053 37-C-0073	CPFF CPFF	May 96 Jul 96			00	307	488	488	Continuing Continuing	TBD
	Contractor TBD TBD Support and Management Organizations N/A Test and Evaluation Organizations N/A	TBD anizations tions	TBD			0	0	0	311	Continuing	TBD
9	Government Furnished Prop	perty: Contract Method/Type	Award or								·
<u>-</u>	<u>Item</u> Description	or Funding Vehicle	Obligation Date	Delivery Date	. 1 +3	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Œ.	Project 643481			Page	Page 13 of 18 Pages	Se			Exhibi	Exhibit R-3 (PE 0603260F)	3260F)

RDT&E PROGRAM ELEMENT/PROJECT	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	0
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	ence Adva	anced Dev	relopmen		РРОЈЕСТ <b>643481</b>
(U) Government Furnished Property Continued:  Contract  Method/Type Award or  Item or Funding Obligation Delivery Description Vehicle Date Product Development Property  N/A  Support and Management Property  N/A  Test and Evaluation Property	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation	<u>Total Prior</u> to FY 1999 258	Budget FY 1999 1,118	Budget FY 2000 1,313	Budget FY 2001 1,287	Budget to Complete TBD	Total Program TBD
Total Project	258	1,118	1,313	1,287	TBD	ТВО
Project 643481	Page 14 of 18 Pages			Exhibi	Exhibit R-3 (PE 0603260F)	3260F)

	RDT&	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFIC/	TION S	жеет (	R-2A E	xhibit)	:	DATE	Februa	February 2000
BUD	BUDGET ACTIVITY				PE NUMBER AND TITLE	R AND TITLE					PROJECT
9	04 - Demonstration and Validation	and Validation			0603260	F Intelli	0603260F Intelligence Advanced Development	vanced	Develop	ment	643482
	COST (\$ i	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
643482		Science & Tech Intelligence Methodology	1,112	1,101	1,079	983	1,064	1,085	1,107	Continuing	TBD
(J)	A. Mission Description Demonstrates and valida requirements. The meth regard to the capabilities	A. Mission Description  Demonstrates and validates intelligence methodologies and techniques for operational employment of simulation models in support of Air Intelligence Agency (AIA) requirements. The methods and techniques will help AIA improve their analysis of current and future foreign weapon systems, and prevent technological surprises with regard to the capabilities of these systems.	es and techni AIA improv	ques for ope e their analy	erational emprisis of curren	ployment of it and future	simulation r foreign wea	nodels in sug pon systems	pport of Air	Intelligence at technologi	e Agency (AIA) ical surprises with
55555	EY 1999 (\$ in Thousands) \$397 Cor \$397 Cor \$318 Cor \$1,112	ands)  Completed Applied Deception Techniques for Manipulative Deception of Forei, Continued Intelligence Analyst Associate (Build 2) for Automated Information Continued Missile System Reentry Vehicle Algorithm Enhancements for NAIC Total	Techniques t Associate ( ntry Vehicle	for Manipul Build 2) for Algorithm	Fechniques for Manipulative Deception of Foreign Signal (Associate (Build 2) for Automated Information Extraction try Vehicle Algorithm Enhancements for NAIC	tion of Fore Information its for NAIC	echniques for Manipulative Deception of Foreign Signal Collection Systems Associate (Build 2) for Automated Information Extraction try Vehicle Algorithm Enhancements for NAIC	ollection Sy:	stems		
5555 5	EY 2000 (\$ in Thousands) \$390 Cor \$321 Cor \$1,101 Tot	Continue Intelligence Analyst Associate (Build 2) for Automated Information Extraction.  Continue Missile System Reentry Vehicle Algorithm Enhancements for NAIC.  Continue Radio Frequency Weapons Modeling Improvements (HEIMDAL2+) (includes Laser Weapons Modeling Code (LODUR). (Reference companion PE 64750, Intelligence Equipment.)  Total	Associate (B try Vehicle, apons Mode nce Equipm	uild 2) for / Algorithm E ling Improv ent.)	Automated In inhancement ements (HE	nformation I s. for NAIC. IMDAL2+)	Extraction. (includes L	aser Weapo.	ทs Modelinչ	g Code (LOI	JUR). (Reference
5555 5	FY 2001 (\$ in Thousands) \$390 Cor \$299 Cor Las \$1,079 Tot	Complete Intelligence Analyst Associate (Build 2) for Automated Information Extraction.  Continue Missile System Reentry Vehicle Algorithm Enhancements for NAIC.  Continue Radio Frequency Weapons Modeling Improvements (HEIMDAL2+) (includes Laser Weapons Modeling Code (LODUR). (includes Laser Weapons Modeling Code (LODUR). (Reference companion PE 64750, Intelligence Equipment.)	Associate (I ftry Vehicle, apons Mode e (LODUR).	Suild 2) for . Algorithm E ling Improv (Reference	Automated I inhancement cements (HE: companion)	information s for NAIC. IMDAL2+) PE 64750,	Extraction. (includes L Intelligence	.aser Weapo. Equipment.)	ns Modeling )	g Code (LOI	OUR). (includes
9	B. Project Change Summary Not Applicable	ummary									
٥	Project 643482			Page 1	Page 15 of 18 Pages	sə			Ä	hibit R-2A (	Exhibit R-2A (PE 0603260F)

	RDT&E BUDGET ITEM JUSTIFICATIO	TIFICATION SHEET (R-2A Exhibit)	R-2A Exh	nibit)	DA	DATE Februal	February 2000
80 <b>2</b>	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603260F Intelli	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	nce Advan	iced Develo	opment	PROJECT <b>643482</b>
(c)	C. Other Program Funding Summary (\$ in Thousands)  FY 1999  FY 2000  Actual  Estimate  Estimate	FY 2002 Estimate	FY 2003. Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
9	Related Activities: 62720F C3I Exploratory Development: information exploitation(image/video/text), multi-sensor collaboration, global information base. 63720F C3 Advanced Technology Development: correlation, fusion algorithms, visualization. 63726F C3 Subsystem Integration: advanced information technology, advanced memory technology. 64750F Intelligence Equipment: modeling and simulation, foreign threat assessment. 31335F Intelligence Data Handling: enhances DoD Intelligence Information Systems (DoDIIS).	video/text), multi- orithms, visualizat vanced memory t assessment. ion Systems (DoL	sensor collabor tion. echnology.	ration, global ii	nformation bass	<b>ပ</b> ဲ	
9	<b>D. Acquisition Strategy</b> All major contracts within this Program Element were awarded after full and open competition.	and open compet	ition.				
<u> </u>	E. Schedule Profile	FY 1999	4	FY 2	FY 2000	, E	EX 2001
99	Applied Deception Techniques Completed Radio Frequency Modeling Continuing (under this PE as well as PE 64750	i I		×			
9	Intel Analyst Associate (Build 2) Completed  * - Denotes completed event  X - Denotes planned event						×
	Project 643482	Page 16 of 18 Pages	Sc			Exhibit R-2A (	Exhibit R-2A (PE 0603260F)

	RDT&E PROGRAM ELEMENT	RAM ELE		/PROJECT COST BREAKDOWN (R-3)	OST BR	EAKDOV	VN (R-3)		DATE Fe	February 2000	00
B <b>8</b>	вирбет астіvіту 04 - Demonstration and Validation	alidation			PE NUMBE 060326(	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	ence Adva	inced Dev	relopmen	:	PROJECT <b>643482</b>
<u>e</u>	A. Project Cost Breakdown (\$ in Thousands)	s in Thousan	ds)				0001 AZ	000	EV 2000		EV 2001
55555	Applied Deception Techniques Intelligence Analysts Associate (Build 2) Missile System Reentry Vehicle Algorithm Enhancement Radio Frequency (RF) Modeling Total	s e (Build 2) le Algorithm E ng	Inhancement				3 3 3 1,1	397 397 318 1,112	390 390 390 321 31,101	3 00	390 390 299 1,079
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	y and Plannin	g Informatio	n (\$ in Thousand	(হু						
<u> </u>	Performing Organizations: Contractor or Government Performing Activity Product Development Organiz Calspan 96-C-0108 E-Systems 96-C-0194	Contract Method/Type or Funding Vehicle ations CPFF	Award or Obligation Date Sep 96	Performing Activity EAC	Project Offfice EAC	Total Prior to FY 1999 87	Budget FY 1999 397 397	Budget FY 2000 390		Budget to Complete Continuing	Total Program TBD TBD
	Carspan 90-C-010s Contractor TBD Support and Management Organizations N/A Test and Evaluation Organizations N/A	CFFF TBD anizations ions	TBD			0	318 0	321 321	299	Continuing	TBD
9	Government Furnished Prop Litem Description Product Development Properts N/A	perty: Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery <u>Date</u>		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Project 643482			Page	Page 17 of 18 Pages	;es			Exhibi	Exhibit R-3 (PE 0603260F)	)3260F)

RDT&E PROGRAM ELEMENT/PR	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	8
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603260F Intelligence Advanced Development	ence Adva	anced Dev	/elopmen		РРОЈЕСТ <b>643482</b>
(U) Government Furnished Property Continued: Support and Management Property N/A Test and Evaluation Property N/A						, , , , , , , , , , , , , , , , , , , ,
Subtotals Subtotal Product Development Subtotal Support and Management	<u>Total Prior</u> to FY 1999 106	Budget FY 1999 1,112	Budget FY 2000 1,101	Budget FY 2001 1,079	Budget to Complete TBD	<u>Total</u> <u>Program</u> TBD
Subtotal Lest and Evaluation Total Project	106	1,112	1,101	1,079	TBD	TBD
Project 643482	Page 18 of 18 Pages			Exhibi	Exhibit R-3 (PE 0603260F)	33260F)

	RDT&E BUDGET ITEM JU	USTIFIC	ATION	JSTIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
BUDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AN <b>0603319F</b>		rne Lase	ID TITLE Airborne Laser Technology	logy		PROJECT <b>644269</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644269	9 Airbome Laser	252,449	304,184	148,637	140,673	111,804	108,936	98,937	0	1,418,704
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	1
111	- This funding profile reflects a Government Only estimate - contractor involvement precluded until after FY 2001 President's Budget is submitted to Congres The total cost reflects cost for Concept Design and Program Definition and Risk Reduction (PDRR) only and contains \$253.084M in funds prior to FY 1999 Quantity of RDT&E Articles total includes purchase of a commercial 747-400F aircraft for PDRR phase. Purchase began in FY 1998 and was delivered in I	e - contracto ram Definitic a commercia	r involveme on and Risk 1747-400F	- contractor involvement precluded until after FY 2001 President's Budget is submitted to Congress m Definition and Risk Reduction (PDRR) only and contains \$253.084M in funds prior to FY 1999 commercial 747-400F aircraft for PDRR phase. Purchase began in FY 1998 and was delivered in Ja	until after F PDRR) only DRR phase.	Y 2001 Pres and contains Purchase b	sident's Bud s \$253.084N egan in FY	get is submi 4 in funds pr 1998 and wa	tted to Congrior to FY 19 is delivered i	- contractor involvement precluded until after FY 2001 President's Budget is submitted to Congress im Definition and Risk Reduction (PDRR) only and contains \$253.084M in funds prior to FY 1999 commercial 747-400F aircraft for PDRR phase. Purchase began in FY 1998 and was delivered in January, 2000
Ð	A. Mission Description  The Airborne Laser (ABL) Program is an Acquisition Category 1D (ACAT 1D) program which will design, build and test a laser weapon system to acquire, track and kill Theater Ballistic Missiles (TBMs) in the boost phase. This weapon system integrates three major subsystems (Laser, Beam Control and Battle Management Command, Control, Communications, Computers and Intelligence (BMC4I)) into a modified commercial Boeing 747-400F aircraft. It also includes ABL-specific ground support. The program awarded the ABL PDRR contract to the Boeing/TRW/Lockheed-Martin team in November 1996, to design, fabricate, integrate, and test the half-power ABL system. An Authority-to-Proceed (ATP-1) decision point was successfully attained in FY 1998. The PDRR phase culminates in lethality (missile shoot-down) demonstrations against boosting TBM representative targets in FY 2005. The PDRR phase will integrate and test key technologies. The EMD program is currently scheduled to begin in FY 2005.	n Category 1 hase. This we d Intelligenc RR contract ed (ATP-1) d erpresentative	D (ACAT 1 capon syster (BMC41)) to the Boeir lecision poin a targets in 3	D) program n integrates t into a modif ng/TRW/Loc nt was succes FY 2005. Th	which will d three major s fied commer kheed-Marti ssfully attain te PDRR pha	esign, build ubsystems ( cial Boeing n team in N ed in FY 19	and test a la Laser, Bean 747-400F ai ovember 1998. The PD grate and tes	iser weapon n Control an rcraft. It als 96, to design RR phase co	system to ac d Battle Mar io includes A i, fabricate, ii ilminates in I logies. The	Category 1D (ACAT 1D) program which will design, build and test a laser weapon system to acquire, track and use. This weapon system integrates three major subsystems (Laser, Beam Control and Battle Management Intelligence (BMC4I)) into a modified commercial Boeing 747-400F aircraft. It also includes ABL-specific R contract to the Boeing/TRW/Lockheed-Martin team in November 1996, to design, fabricate, integrate, and test (ATP-1) decision point was successfully attained in FY 1998. The PDRR phase culminates in lethality (missile presentative targets in FY 2005. The PDRR phase will integrate and test key technologies. The EMD program is
99	FY 1999 (\$ in Thousands) \$192,319 Continued Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, a including beginning design of the Systems Integration Lab (SIL) at Birk facility at Edwards AFB. CA	theed-Martin the Systems	PDRR cont	need-Martin PDRR contract effort for design, fabrication, integration, and testing the ABL weapon system, the Systems Integration Lab (SIL) at Birk facility at Edwards AFB. CA	r design, fab Birk facility	rrication, int	egration, an	d testing the	ABL weapo	n system,
99	\$34,669 PDRR commercial aircraft payments \$5,470 Continued support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing in lasers, aircraft, and aircraft integration	yments studies, simu	Jations and	analyses, tec	chnical suppo	ort, risk man	lagement, ar	ıd an indepe	ndent review	team
5	\$19,991 Continued support for atmospheric characterization tests (North Oscura Peak (NOP), star scintillometer), labor, training, Integrated Product Team (IPT) narticination and other conserment agencies	heric charact	erization tes	sts (North Os	cura Peak (P	VOP), star sc	sintillometer	:), labor, trai	ning, Integra	ted Product
9	(U) \$252,449 Total		mom again							
ď	Project 644269		Page	Page 1 of 6 Pages	S				xhibit R-2 (	Exhibit R-2 (PE 0603319F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	TION SHEET (R-2 Exhibit	(;	DATE February 2000	00
80DC	вирсет астіліту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne La	וחדוד⊑ Airborne Laser Technology		РRОЈЕСТ <b>644269</b>
3	A. Mission Description Continued		-		
99	FY 2000 (\$ in Thousands) \$202,850 Continue Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, and testing the ABL weapon system, including design of SII at Birk facility at Edwards AFR CA	cd-Martin PDRR contract effort for design, fabrication,	integration, and te	sting the ABL weapon system	u,
99	\$83,778 Final PDRR commercial aircraft payment (aircraft delivery)  \$4,327 Continue support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing	oracts for E., C., craft delivery) ins and analyses, technical support, risk r	nanagement, and a	n independent review team sp	oecializing
99	\$13,229 Continue support for labor, training, IPT participation, and other government agencies; conducts overseas star scintillometer campaign \$304,184 Total  Note: ABL has gone through a restructure which was not completed until after the FY 2000 PB submission. This accounts for the variability of costs since the FY 2000 PB.	cipation, and other government agencies; until after the FY 2000 PB submission.	; conducts overseas This accounts for t	star scintillometer campaign he variability of costs since th	he FY 2000
99	FY 2001 (\$ in Thousands) \$138,000 Continue Boeing/TRW/Lockheed-Martin PDRR contract effort for design, fabrication, integration, and testing the ABL weapon system,	R contract effort for design, fabrication,	, integration, and te	sting the ABL weapon systen	'n,
9	\$3,874 Continue support for special studies, simulations and analyses, technical support, risk management, and an independent review team specializing in lasers aircraft and aircraft integration	ons and analyses, technical support, risk 1	management, and a	n independent review team sp	pecializing
99	\$6,763 Continue support for labor, training, IPT participation, and other government agencies \$148,637 Total	cipation, and other government agencies			
9	B. Budget Activity Justification This program is in budget activity 4 (BAC-4) - Demonstration and Validation; ABL is a major defense acquisition program which was authorized to enter PDRR at the Milestone I, November 1996.	alidation; ABL is a major defense acqui	isition program whi	ch was authorized to enter PL	ORR at the
9	C. Program Change Summary (\$ in Thousands)	FY 1999	FY 2000	FY 2001	Total Cost
99	Previous President's Budget (FY 2000 PBR) Appropriated Value	265,679 267,219	308,634 308,634	241,057	1,630,738
<u>E</u>	Adjustments to Appropriated Value a. Congressional/General Reductions	-785 - 785	-62		
	<ul> <li>b. Small Business Innovative Research</li> <li>c. Omnibus or Other Above Threshold Reprogram</li> </ul>	74.0-	-2,465		
a.	Project 644269	Page 2 of 6 Pages		Exhibit R-2 (PE 0603319F)	303319F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	M JUSTIF	ICATION	SHEET	(R-2 Exhi	bit)	0	DATE February 2000	, 2000
BUD( <b>04</b> -	BUDGET ACTIVITY   04 - Demonstration and Validation			PE NUMBER AND TITLE 0603319F Airbo	AND TITLE F. Airborne	AD TITLE Airborne Laser Technology	chnology		РВОЈЕСТ <b>644269</b>
(n)	C. Program Change Summary (\$ in Thousands) Continued	nds) Continue	ارة ا		FV 1000	EV 2000	, i	7,000	
	d. Below Threshold Reprogram e. Rescissions				-3,476 -2,167	-1,923		7 7007	Total Cost
55	f. Other Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR Note: FY 1999 \$3.7M BTR into ABL for mandated overseas star scintillometer tests not reflected in table above.	BR Idated overseas	star scintillon	neter tests not	252,449 reflected in tab	304,184 ole above.		-92,420 148,637	1,418,704
<b>£</b>	Significant Program Changes: Significant Program Changes: The Department of Defense restructured the program to delay lethal demonstration of a boosting theater ballistic missile (TBM) from FY 2003 to FY 2005 and Initial Operational Capability (IOC)/Full Operational Capability (FOC) are TBD.	t of Defense re pability (IOC)	structured the /Full Operatio	program to del	ense restructured the program to delay lethal demon (IOC)/Full Operational Capability (FOC) are TBD	onstration of a l J.	ooosting thea	er ballistic missile (	(TBM) from
9	D. Other Program Funding Summary (\$ in Thousands)  EY 1999  EY 2000  Actual Estimate	Chousands) EX 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
99	AF RDT&E PE 0604350F Airborne Laser EMD	0	0	0	0	0	197,818	1,927,000	2,124,818
58	Quantity* 0	0	0	0	0	0	1	0	
0	Note 1 - PE 0603605F, Advanced Weapons - supports in ABL Operational Requirements Document (ORD)		y developing t	echnologies fc	r potential perl	formance enha	ncements abo	ABL by developing technologies for potential performance enhancements above current requirements identified	ents identified
	Note 2 - PE 0207150, ABL Procurement (including MILCON) has moved outside the FYDP. It is planned that this PE will procure 5 new ABL weapon systems and refurbish the 2 RDT&E test articles to production-representative configurations.	ding MILCON, on-representativ	) has moved or ve configuratic	utside the FYL ons.	P. It is planne	d that this PE v	vill procure 5	new ABL weapon	systems and
	* Quantity refers to EMD RDT&E test article only (PE	only (PE 0604350F).		urchased an R	DT&E test arti	cle (the PDRR	a/c) beginnin	ABL purchased an RDT&E test article (the PDRR a/c) beginning in FY 1998 (PE 0603319F).	)603319F).
<b>a</b>	Project 644269		Pag	Page 3 of 6 Pages				Exhibit R-2 (PE 0603319F)	E 0603319F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2 E	xhibit)			DATE	Febr	February 2000	
BUD( <b>04</b> -	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603319F Airbo	D TITLE Airborne Laser Technology	ser Tec	hnolo	λΒί		PRO <b>64</b> 4	РRОЈЕСТ <b>644269</b>
9	E. Acquisition Strategy Milestone (MS) I decision was November 1996 authorizing entry into PDRR. MS II for EMD is projected in FY 2005; MS III decision for Production is to be determined (TBD). The PDRR program is structured to demonstrate technical risk reduction achievements at key junctures throughout the PDRR phase. The Air Force established reviews of the program at two key points: Authority-to-Proceed I and II (ATP-1 and ATP-2, respectively) during PDRR to ensure planned progress is attained. ABL successfully completed ATP-1 on 26 Jun 98. ATP-2 is currently scheduled for FY 2004. PDRR culminates in Iethality (missile shoot-down) demonstrations against boosting theater ballistic missiles in FY 2005. RDT&E test articles will be refurbished to production representative articles using Procurement funds.	. MS II for EMD is pro al risk reduction achieve and II (ATP-1 and ATF ttly scheduled for FY 20 E test articles will be re	jected in F* ments at ke 2-2, respecti 104. PDRR sfurbished t	Y 2005; N. y junctur vely) dur culminat	AS III de es throu ing PDF tes in let ion repr	ecision for ghout the tR to ensu the hality (mi esentative	Product PDRR I Ire plann ssile sho	tion is to be phase. The Ained progress is out-down)	r Force ment
9	E. Schedule Profile	EY 1999 2 3 4		EY 2000 2 3	900 °°	4		FY 2001	4
666666666666666666666666666666666666666	Milestone I (FY 1997)  Authority to Proceed (ATP-1)(FY 1998)  Beam Control Processor Demo  North Oscura Peak Integration and Tests  Star Scintillometer Tests (CONUS)  Star Scintillometer Tests (Theater)  Green Aircraft delivered to Wichita  Critical Design Review  Turret Window Fabrication Complete  Laser Module Airworthiness Demo  Aircraft Modifications Complete (FY 2002)  Systems Integration Lab Handover (FY 2003)  ATP-2 (FY 2004)  Lethality Demonstration (FY 2005 timeframe)  Milestone III (FBD)  IOC (TBD)  * = Completed Event  X = Planned Event	* *	* *	×××	× × ×			×	×
Ъ	Project 644269	Page 4 of 6 Pages				Ш	xhibit F	Exhibit R-2 (PE 0603319F)	319F)

	RDT&E PROGRAM ELEMENT	AM ELE		/PROJECT C	SOST BE	COST BREAKDOWN (R-3)	WN (R-3)		DATE Fe	February 2000	e
800 <b>04</b>	вирсет астилту 04 - Demonstration and Validation	lidation			PE NUMBER AI <b>0603319F</b>	z	ne Laser	וס דודרב Airborne Laser Technology	X	9	PROJECT <b>644269</b>
<u>e</u>	A. Project Cost Breakdown (\$ in Thousands)	in Thousand	ন্ত্ৰ				FV 1	EV 1000	EV 2000	<b>-</b>	EV 2001
99	Major Contracts (PDRR contract and Concept Design) Support Contracts (Technical Support, Analysis)	act and Conce Support, Anal	ept Design) lysis)				226,988 226,988 5,470	26,988 5,470	286,628 4,327	9 aa 15	138,000
33	Test/Other Government/Misc Support/Salaries/IPTs Total	Support/Salar	ies/IPTs				19,991 252,449	19,991 52,449	13,229		6,763
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	and Plannin	g Information	(\$ in Thousan	(sp)						
3	Performing Organizations:										
	Li .	Contract	A traces	Doeforming	Decion						
	Performing or		Obligation	Activity	Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity	의	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	ganiz	tions		į		i d	0	0			
	Boeing Derense & Space C.	CFAF	12 NOV 96	180	1,249,097	1/0,081	770,988	780,028	138,000	428,000	1,249,697
	ntract	CPFF	9 May 94	22,071	22,071	22,071	0	0	0	0	22,071
	(Rockwell International, CA)										
	Concept Design Contract C	CPFF	9 May 94	21,689	21,689	21,689	0	0	0	0	21,689
	(Boeing Defense & Space										
	Group, WA)	1.5.1.5.	12 12 12	1.7	0 - 15 - 15 - 0	da 10	, 14. J.	Ē		٠	
	Note - The revised program cannot be discussed with the contractor until after the F r 2001 FB is submitted to Congress. Therefore, we have no performing activity	mot be discus:	sed with the cor	ntractor unui al	iter the F r 20	VI FB IS SUON	nited to Congr	ress. Inererore	, we nave no	periorming a	cuvity
· · · · · · · ·	estimate at completion (EAC) at this time. Support and Management Organizations	t unis ume. nizations									
	Technical Support Contracts V	Various	Varies	N/A	N/A	15,465	5,470	4,327	3,874	12,000	41,136
	Government In-House and V.	Various	Varies	N/A	N/A	22,699	18,491	10,259	5,089	12,576	69,114
	Other External Support	Ş									
	Air Force Flight Test Center MIPR	II.K	Varies	N/A	N/A	1,079	1,500	2,970	1,674	7,774	14,997
<u> </u>	(AFFTC)										
u.	Project 644269			Pa	Page 5 of 6 Pages	So			Exhibit	Exhibit R-3 (PE 0603319F)	03319F)
	22					2				- 1 - 1	

RDT&E PROGRAM ELEMENT/PROJEC	/PROJECT COST BREAKDOWN (R-3)	<b>NN (R-3)</b>		DATE Fe	February 2000	٥
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603319F Airborne Laser Technology	ne Laser T	echnolog	<u> </u>	id <b>9</b>	PROJECT <b>644269</b>
(U) Government Furnished Property:  Contract  Method/Type Award or  Item or Funding Obligation Delivery  Description Product Development Property	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget EY 2001	Budget to Complete	Total Program
The government is providing miscellaneous support equipment during the test phase of the PDRR program. In addition, the government is also providing hardware items to facilitate Infrared Search and Track (IRST) tests. The costs of these two categories of GFP fall below the \$1M reporting threshold. In addition, targets for the PDRR test program will be provided as GFP and will be listed separately when they become part of the contract.	e test phase of the PDRR progr nese two categories of GFP fall when they become part of the	am. In addition below the \$11 contract.	on, the govern M reporting th	ıment is also ıreshold. İn a	providing hard addition, target	ware s for the
AFFTC is the sole representative to the customer for Test and Evaluation. AFFTC receives funding from the program office and controls the distribution of these funds within AFFTC, the White Sands Missile Range (WSMR), and the Western Test Range (WTR).  Support and Management Property  Test and Evaluation Property	ion. AFFTC receives funding Western Test Range (WTR).	from the progr	am office and	d controls the	distribution of	these
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	Total Prior to FY 1999 213,841 38,164 1,079 253,084	Budget FY 1999 226,988 23,961 1,500 252,449	Budget EY 2000 286,628 14,586 2,970 304,184	Budget EY 2001 138,000 8,963 1,674 148,637	Budget to Complete 428,000 24,576 7,774 460,350	Total Program 1,293,457 110,250 14,997 1,418,704
Project 644269	Page 6 of 6 Pages			Exhibi	Exhibit R-3 (PE 0603319F)	3319F)
	418					

	RDT&E BUDGET ITEM JU	GET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)	:	DATE	Februa	February 2000
BUDG 04	BUDGET ACTIVITY  04 - Demonstration and Validation	idation			PE NUMBER AND TITLE 0603430F Advan	RAND TITLE	PE NUMBER AND TITLE OCCUPATION (Space)	F MILSA	TCOM (8	bace	PROJECT <b>644050</b>
	COST (\$ in Thousands)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644050	0 Advanced MILSATCOM		54,623	95,529	246,396	519,832	470,373	340,566	243,105	292,883	2,383,788
	Quantity of RDT&E Articles		0	0	0	0	0	0	0	2	2
<b>6</b>	A. Mission Description Develop and acquire Advanced Extremely High Frequency (EHF) Military Satellite Communications (MILSATCOM) satellites and cryptography with necessary modifications to the mission control segment for survivable, jam-resistant, worldwide, secure communications for the strategic and tactical warfighter. Advanced EHF (AEHF) satellites will replenish the existing EHF system (Milstar) with additional capability and decreased launch costs. The program is utilizing as much commercial technology as possible and will ensure technology development sufficient for a medium launch vehicle-class satellite. The Advanced EHF capability will be available for first launch in 2006. Activities funded under this program element implement the Secretary of Defense's 1993 MILSATCOM Bottom Up Review decision to field lower cost, advanced MILSATCOM satellite as a replenishment to Milstar. The DoD Space Architect in 1996 and OSD-led MILSATCOM Transition Team in 1997 reviewed the options for future EHF service and concluded this program is the best solution for those requirements. The Advanced EHF program implements the architecture defined by the DoD Space Architect and directed by the Joint Space Management Board and will address requirements in the MILSATCOM Capstone Requirements Document (24 April 1998) and the Operational Requirements approved by the Joint Requirements Oversight Council in April 1999.	Extremely High Frequol Segment for survithe existing EHF sysmsure technology dees funded under this OM satellite as a rep. EFF service and conc. Space Architect and ril 1998) and the Optimal 1998) and the Optimal Service and the Optimal 1998) and the Optimal service and the Optimal 1998.	uency (EHF ivable, jam- tem (Milstar velopment sy program ele ilenishment t	Military Siresistant, working additudificient for ment impler o Milstar. Trogram is the Joint Spiquirements I	atellite Coma orldwide, sec- ional capabil : a medium la ment the Sec- The DoD Spa e best solutic ace Manager	nunications ure commu ity and decruunch vehicl retary of Der ree Architect on for those inent Board a	(MILSATC incations for eased launch e-class satel fense's 1993 t in 1996 and requirement and will addine Joint Req	OM) satellit the strategion costs. The lite. The Ad MILSATCO d OSD-led N s. The Adva ress requires	es and crypt c and tactica program is vanced EHF OM Bottom AILSATCO inced EHF proced EHF proced EHF or an	ography with I warfighter. utilizing as no capability w Up Review of Transition program implures ATCC MILSATCC uncil in Apri	Advanced EHF anch commercial vill be available decision to field a Team in 1997 ements the M Capstone 11999.
99999	FY 1999 (\$ in Thousands) \$1,761 Continuec \$52,324 Continuec \$538 Continuec	ds) Continued Advanced EHF technology validation Continued processing Subsystem Engineering Model Program Continued AEHF Program Office Support Fotal	thnology vali tem Engineer ffice Support	idation ring Model	Program						
5555555	EY 2000 (\$ in Thousands) \$1,700	Continued Advanced EHF technology validation Complete Processing Subsystem Engineering Model Program Begin System Definition Satellite Cryptographic Development Continued AEHF Program Office Support Activities Joint Terminal Engineering Office (JTEO) Support	chnology val em Engineer opment ffice (JTEO)	lidation ing Model I Activities ) Support	Program						
ď	Project 644050			Page	Page 1 of 6 Pages	8				xhibit R-2 (	Exhibit R-2 (PE 0603430F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	I SHEET (R-2 Exhibi	t)	DATE February 2000	7 2000
8006 <b>04 -</b>	вирвет астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603430F Advanced	ıртіте Advanced (EHF MILSATCOM (Space)	COM (Space)	PROJECT <b>644050</b>
9	A. Mission Description Continued				
5555555	<ul> <li>EY 2001 (\$\$ in Thousands)</li> <li>\$8,000 Complete System Definition</li> <li>\$199,898 Begin Engineering &amp; Manufacturing Development (EMD) of the first AEHF satellite</li> <li>\$18,300 Continued Satellite Cryptographic Development</li> <li>\$16,888 Program Office Support - Continue AEHF Support and Transition Advanced EHF MILSATCOM Joint Program Office Support from Milstar PE</li> <li>\$3,310 JTEO Support</li> <li>\$246,396 Total</li> </ul>	EMD) of the first AEHF satellite ind Transition Advanced EHF M	LSATCOM Joint F	rogram Office Support	from Milstar PE
3	<b>B. Budget Activity Justification</b> This program is in Budget Activity 4, Research Category Demonstration and Validation, since it funds Advanced EHF technology validation and modeling.	d Validation, since it funds Adva	nced EHF technolo	gy validation and model	ing.
3	C. Program Change Summary (S in Thousands)	CCC + 7 h L			C E
9	Previous President's Budget (FY 2000 PBR)	54,150 54,150	97,066	248,587	10tal Cost 2,231,640
9	Appropriated Value	54,413	92,066		
9	Adjustments to Appropriated Value a. Congressional/General Reductions	-263	<i>L</i> -		
	b. Small Business Innovative Research	-1,057			
	c. Omnibus or Other Above Threshold Reprogram		-774		
	d. Below Threshold Reprogram	1,836			
	e. Rescissions f. Other	-306	-756		
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR	54,623	95,529	-2,191 246,396	2,383,788
<u>(C</u>	Significant Program Changes: \$1,836K FY99 Below Threshold Reprogramming action funded a Cost As an Independent Variable (CAIV) analysis to prioritize program requirements within approved	an Independent Variable (CAIV)	analysis to prioritiz	e program requirements	within approved
	funding levels\$2,191K FY01 adjustment due to inflation rate changes. FY04 and FY05 adjustments realigned funds from the Missile Procurement appropriation to the RDT&E appropriation to more appropriately align funding with work being performed.	appropriation to the RDT&E app	propriation to more	appropriately align fund	ing with work
ā		Page 2 of 6 Pages		Exhibit R-2 (PE 0603430F)	E 0603430F)

	RDT&F RIDGET ITEM III	GET ITE		NOITACI	STIEICATION SHEET (R-2 Exhibit)	R-2 Exhi	hit)	/O	DATE EAPTHORY 2000	0000
							(3)		rebidai	2000
80 <b>8</b>	BUDGET ACTIVITY 04 - Demonstration and Validation	lidation			PE NUMBER AND TITLE 0603430F Adva	AND TITLE  Advance	ID TITLE Advanced (EHF MILSATCOM (Space)	LSATCOM	(Space)	PROJECT <b>644050</b>
9	D. Other Program Funding Summary (\$ in Thousands)  EY 1992  EY 2000  Actual Estimate	mmary (\$ in 7 EY 1999 Actual	Chousands) FY 2000 Estimate	FY 2001 Estimate	Extimate	EY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to	Total Cost
99		0	0	0	20,000	376,135	280,753	300,100	630,421	1,607,409
9	MILSA1COM Procurement PE 33600F, AF Wideband 3080 (CCSC)	0	0	4,852	5,411	5,503	8,115	2,209	0	26,090
99		0	0	11,500	13,300	24,400	46,600	25,900	0	121,700
9	PE 0604479F, Milstar LDR/MDR Satellite									
9	Communications PE 0604577N, EHF Satellite									
9	Communications PE 0603432F, Polar MILSATCOM									
9										
ව	E. Acquisition Strategy  The Advanced MILSATCOM strategy is a competitive acquisition between two contractors for System Definition. One contractor will be selected to perform Engineering and Manufacturing Development and fabrication of five satellites. Advanced MILSATCOM will incorporate improvements from Milstar and commercial SATCOM practices into the next generation EHF military communication satellite system.	trategy is a com Development a t generation EF	petitive acquis ind fabrication IF military con	ition between to five satellite	two contractors ss. Advanced Itellite system.	for System D	efinition. One will incorpora	contractor wil	l be selected to per its from Milstar ar	rform nd commercial
9	F. Schedule Profile				FY 1999		EX 2000	000	E	FY 2001
	Project 644050			Pag	Page 3 of 6 Pages				Exhibit R-2 (PE 0603430F)	E 0603430F)

RDT&E BUDGET ITEM JUSTIFICATION S	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000	
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603430F Advanced (EHF MILSATCOM (Space)	PROJECT 644050	ੂ <b>20</b>
(U) F. Schedule Profile Continued	EY 1999 EY 2000 2 3 4 1 2 3 4	FY 2001	4
(U) Milestone I DAB  (U) Award System Definition Contract (U) Processing Engineering Model Completion (U) Milestone II/III - DAB (U) Award EMD Contract (U) First Launch - (FY06)  * = Completed Event	*	× ×	
Project 644050 Page 4	Page 4 of 6 Pages	Exhibit R-2 (PE 0603430F)	0F)

	RDT&E PROG	PROGRAM ELEMEN		T/PROJECT C	COST BF	BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	00
8UD <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	'alidation			PE NUMBER AT <b>0603430F</b>		ютпс Advanced (EHF MILSATCOM (Space)	MILSATCO	JM (Spac		РRОЈЕСТ <b>644050</b>
9	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	(জ				EV 1000	000	TV 2000	_	EV 2001
	MII SATCOM Technology Validation Program	'alidation Pro <del>or</del> s	E					1.761	1,700	ə ~	0
3	Processing Subsystem Engineering Model	ering Model					52,324	324	29,391		0
3	Program Office Support	)					्या	538	4,822	<b>C</b> 1	16,888
9	System Definition							0	34,000	-	8,000
93	Cryptographic Development							0 0	22,400	<b>~</b> -	18,300
<u> </u>	Satellite Evilo Joint Terminal Engineering Office (JTEO) Total	office (JTEO)					0 0 54,623	0 523	3,216 95,529		3,310 246,396
3	B. Budget Acquisition History and Planning Inform	ry and Plannin	g Information.	nation (\$ in Thousands)	(3)						
9	Performing Organizations:										
	Contractor or	Contract	•								
	Government	Method/1ype	Award or	Performing	Project		•		•		Ē
	Pertorming Activity	or Funding Vehicle	<u>Obligation</u> Date	Activity EAC	Office EAC	<u>Total Prior</u> to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	Product Development Organizations	zations									
	NSA	MIPR	Dec 99	55,200	55,200	0	0	22,400	18,300	0	40,700
	JTEO	PR	Continuing	95,644	95,644	2,000	0	3,216	3,310	74,778	83,304
	MIT/LL	MIPR	Feb 95	11,110	11,110	1,527	1,761	1,700	0	0	4,988
	SS	CPFF	May 97	66,851	66,851	25,392	26,771	15,012	0	0	67,175
	TRW	CPFF	May 97	60,862	60,862	22,151	25,553	14,379	0	0	62,083
	Various	Various	95-01	A/N	N/A	66,659		0	0	0	66,659
	Lockheed Martin	FFP	Oct FY00	21,000	21,000	0	0	17,000	4,000	0	21,000
	Hughes	FFP	Oct FY00	21,000	21,000	0	0	17,000	4,000	0	21,000
	EMD Contractor (TBD)	TBD	Apr FY01	TBD	TBD	0	0	0	199,898	1,710,145	1,910,043
	Support and Management Organizations	Varions	2005			7.757	638	7 877	16 999	91 836	106 836
	Test and Evaluation Organizations	tions				î		1	555		
_	Project 644050			Pag	Page 5 of 6 Pages	se			Exhibi	Exhibit R-3 (PE 0603430F)	03430F)

RDT&E PROGRAM ELEMENT	/PROJECT	//PROJECT COST BREAKDOWN (R-3)	WN (R-3)		DATE Fe	February 2000	8
BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603430F Advan	ced (EHF	⊌ोगाट Advanced (EHF MILSATCOM (Space)	OM (Spac		PROJECT <b>644050</b>
(U) Government Furnished Property:  Contract  Method/Type Award or  Item or Funding Obligation Description Vehicle Date Product Development Property None Support and Management Property None Test and Evaluation Property	n <u>Delivery</u> Date	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project		Total Prior to FY 1999 117,729 2,752 120,481	Budget EY 1999 54,085 538 54,623	Budget EY 2000 90,707 4,822 95,529	Budget EY 2001 229,508 16,888 246,396	Budget to Complete 1,784,923 81,836 1,866,759	Total Program 2,276,952 106,836 2,383,788
Project 644050	H	Page 6 of 6 Pages			Exhibi	Exhibit R-3 (PE 0603430F)	3430F)

	RDT8	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE		February 2000
BUDG <b>04 -</b>	вирсет аститту 04 - Demonstration and Validation	and Validation			PE NUMBER AND TITLE 0603432F Polar	RAND TITLE	MILSAT	ир тітге Polar MILSATCOM (Space)	ace)		PROJECT <b>644052</b>
	COST (\$	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644052	52 Polar Satellite Communications	nmunications	36,291	39,049	26,068	12,923	8,631	3,387	3,379	0	277,039
	Quantity of RDT&E Articles	E Articles	0	0	0	0	1	<b>-</b>	0	0	3
(D)	A. Mission Description The Polar MILSATCON Milstar program which f	A. Mission Description The Polar MILSATCOM program will provide protected communications services to U.S. forces operating in the northern polar region. It is the cheaper 'adjunct' to the Milstar program which followed the 1992 Milstar program restructure which deleted two polar orbiting Milstar satellites and directed the Air Force to find a more	cted commu	nications ser	rvices to U.S deleted two	forces oper	rating in the	northern po	lar region. I	It is the chear	per 'adjunct' to the find a more
	cost-effective solutic (JROC) validated the MILSATCOM progr	cost-effective solution. In Oct 94, the DoD identified an immediate need for protected polar communications, and in Jul 95, the Joint Requirements Oversight Council (JROC) validated the Polar MILSATCOM ORD which contained the interim requirements. In July 95, the Defense Acquisition Executive reviewed Polar MILSATCOM program and approved execution of the Interim Polar subset to expeditiously place a modified Extremely High Frequency (EHF) payload designed for	l an immedia ch contained ie Interim Pc	tte need for j the interim lar subset to	protected porequirement	lar commun. S. In July 9. sly place a m	ications, and 5, the Defen todified Extr	l in Jul 95, tl se Acquisiti remely High	he Joint Req on Executiva 1 Frequency	quirements O e reviewed P (EHF) paylo	versight Council olar
	the Navy's UHF Foll Joint Space Manager first of three interim	the Navy's UHF Follow On (UFO) system onto a classified host satellite to provide limited requirements satisfaction while pursuing a long term solution. In Aug 96, the Joint Space Management Board (JSMB) approved the DoD Space Architect's option for Polar MILSATCOM to sustain 24 hours-per-day EHF Polar capability. The first of three interim (hosted) packages was launched in Nov 97, the last two will launch in FY03 and FY04.	ssified host s DoD Space in Nov 97, tl	atellite to pr Architect's he last two v	rovide limite option for P will launch in	d requireme olar MILSA n FY03 and	nts satisfacti TCOM to su FY04.	ion while pu ustain 24 ho	irsuing a lon, urs-per-day	ig term soluti EHF Polar c	on. In Aug 96, the apability. The
99	EY 1999 (\$ in Thousands) \$36,291 Cor	sands)  Continued parts buy and payload/integration development with host vehicle for Interim Polar packages 2 and 3. (Through classified host	oad/integration	on developn	nent with ho	st vehicle fo	r Interim Po	ılar packages	s 2 and 3. (T	Through clas	sified host
9	\$36,291	Contract) Total									
99	EY 2000 (\$ in Thousands) \$39,049 Co	sands)  Continue parts buy and payload/integration development with host vehicle for Interim Polar packages 2 and 3. (Through classified host	ıd/integratioı	n developme	ent with host	vehicle for	Interim Pola	ar packages	2 and 3. (Tł	hrough classi	ified host
9	\$39,049	contact) Total									
99	FY 2001 (\$ in Thousands) \$26,068 Co	sands) Continue payload development	ıt and integra	tion develo	pment with 1	host vehicle	for Interim	Polar packag	ges 2 and 3.	(Through th	and integration development with host vehicle for Interim Polar packages 2 and 3. (Through the classified host
<u> </u>	\$26,068	contract) Total									
<u>G</u>	Project 644052			Page	Page 1 of 5 Pages	55			ш	Exhibit R-2	Exhibit R-2 (PE 0603432F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	ICATION SHEET (	(R-2 Exhi	bit)	Ď	DATE February 2000	2000
BUD( <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603432F Polar	AND TITLE F <b>Polar MI</b>	ID TITLE Polar MILSATCOM (Space)	(Space)		PROJECT <b>644052</b>
(D)	B. Budget Activity Justification The PolarMILSATCOM program is in Budget Activity 4, Dem solution (Interim Polar).	4, Demonstration and Validation, based on a 30 Mar 95 USD(A&T) memorandum to pursue the interim hosted	nased on a 30 M	Aar 95 USD(A	&T) memoran	dum to pursue the ii	nterim hosted
3	C. Program Change Summary (\$ in Thousands)			i		,	
5	Previous President's Budget (FY 2000 PBR)		41,367	39,678	•	FY 2001 26,300	Total Cost 278,360
33	Appropriated Value Adjustments to Appropriated Value		41,508	39,6/8	•		
	a. Congressional/General Reductions b. Small Business Innovative Research		-141	<b>-</b>			
	c. Omnibus or Other Above Threshold Reprogram			-319			
	d. Below Threshold Reprogram		-4,873				
	e. Rescissions		-203	-309			
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR		36,291	39,049		-232 26,068	277,039
9	Significant Program Changes: (U) FY 99 and FY 01 adjustments made to fund higher priority Air Force efforts. The total program increased due to an error on the FY00 PB request.	y Air Force efforts. The tota	al program incı	reased due to a	n error on the	FY00 PB request.	
9	D. Other Program Funding Summary (S in Thousands)  EX 1999 EY 2000  Actual Estimate	FY 2001 FY 2002 Ferimate Ferimate	FY 2003 Fertimate	FY 2004 Fertimate	FX 2005 Fertimate	Cost to	Total Cost
9							
<u> </u>	E. Acquisition Strategy  The Air Force provides funds to the classified host program office to modify the host satellite system contract to include the Polar EHF package. The host program office has total acquisition responsibility for interim Polar.	ice to modify the host satellii	ite system cont	ract to include	the Polar EHF	package. The host	; program
α.	Project 644052	Page 2 of 5 Pages				Exhibit R-2 (PE 0603432F)	0603432F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603432F POIAR MILSATCOM (Space)	PROJECT <b>644052</b>
(U) F. Schedule Profile	EY 1999 EY 2000 2 3 4 1 2 3 4	EY 2001
<ul> <li>(U) Hosted Interim Payload #1 Launched (1QFY98)</li> <li>(U) Preliminary Design Review</li> <li>(U) Critical Design Review</li> <li>(U) (Payloads 2 and 3 to launch in FYs 03 &amp; 04)</li> </ul>	· ×	n
Project 644052	Page 3 of 5 Pages	Exhibit R-2 (PE 0603432F)

	RDT&E PROGRAM ELEMEN		I/PROJECT		COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b> l	February 2000	00
80 0	BUDGET ACTIVITY  04 - Demonstration and Validation	tion		PE NUMBER AN <b>0603432F</b>		MILSATCO	וס דויורם Polar MILSATCOM (Space)		9	РRОЈЕСТ <b>644052</b>
<b>(3</b>	A. Project Cost Breakdown (\$ in Thousands)	<u>'housands)</u>				FY 1999	666	FY 2000	91	FY 2001
993	Packages 2 & 3 Planning, Design, and Parts Buy Packages 2 & 3 Payload/Integration Development Total	nd Parts Buy Development				9 36,291 36,291	0 36,291 36,291	0 39,049 39,049	6	0 26,068 26,068
9	B. Budget Acquisition History and Planning Information (\$\mathcal{S}\$ in Thousands)	Planning Informa	tion (S in Thous	(spue						
9	Performing Organizations: Contractor or Government Performing Activity	Contract Method/Type Award or or Funding Obligation Vehicle Date	EAC	Project Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Product Development Organizations Classified Classified Support and Management Organizations N/A Test and Evaluation Organizations	fied June 95 ions	Continuing	Continuing	147,311	36,291	39,049	26,068	28,320	277,039
<u> </u>	N/A  Government Furnished Prop  Item Description Product Development Property N/A Support and Management Prop N/A Test and Evaluation Property N/A	verty:  Contract Method/Type Award or or Funding Obligation Vehicle Date /	n Delivery Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Project 644052			Page 4 of 5 Pages	ses			Exhib	Exhibit R-3 (PE 0603432F)	303432F)

RDT&E PROGRAM ELEMENT/PROJEC	I/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	٩
	PE NUMBER AND TITLE				<u>.</u>	PROJECT
04 - Demonstration and Validation	10603432F Polar MILSATCOM (Space)	<b>AILSATCC</b>	M (Space		ě	644052
Subtotals	Total Prior	Budget FV 1000	Budget FV 2000	Budget FV 2001	Budget to	Total Program
Subtotal Product Development	147,311	36,291	39,049	26,068	28,320	277,039
Subtotal Support and Management				,		
Total Project	147,311	36,291	39,049	26,068	28,320	277,039
Project 644052	Page 5 of 5 Pages			Exhibi	Exhibit R-3 (PE 0603432F)	3432F)

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	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	February 2000	y 2000
8UD <b>04</b>	вирсет астіvity <b>04 - Demonstration and Validation</b>			PE NUMBER AND TITLE 0603434F Nation Environmental S	AND TITLE  F Nation  mental S	PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operati Environmental Satellite System (NPOESS)	Orbiting	PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)	onal	PROJECT <b>644056</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644056	56 National Polar-orbiting Operational Env. Sat. Syst.	62,068	59,180	76,654	156,503	236,471	306,454	325,429	695,698	2,001,757
	Quantity of RDT&E Articles	0	0	0	1	0	0	0	-	2
<b>5</b>	A. Mission Description Presidential Decision Directive/NSTC-2 (May 1994) directs the Departments of Defense (DoD) and Commerce (DoC) and the National Aeronautics and Space Administration to establish a converged national polar-orbiting weather satellite program. The converged program, the National Polar-orbiting Operational Environmental Satellite System (NPOESS), will combine the follow-on to DoD's Defense Meteorological Satellite Program (DMSP) and the DoC's Polar-orbiting Operational Environmental Satellite (POES) program. A tri-agency Integrated Program Office (IPO) was established on 1 Oct 94 to manage the acquisition and operations of the converged system. NPOESS will provide operational military commanders and civilian leaders timely, quality weather and environmental data for operational military and civil use. It will provide operations infrared cloud cover imagery and other atmospheric, oceanographic, terrestrial, and space environmental information. At least two NPOESS satellites will be required in sun synchronous 450 nm polar-orbit at all times (sun synchronous means the satellites environmental information of Meteorological Satellites, will comprise the Joint Polar System of weather satellites. NPOESS successfully completed Milestone I on 17 March 1997.	directs the I. r-orbiting w bine the foll in the foll over a tri-agen rovide operational resour vide visible tellites will I f their 14 or satellites, w	Departments eather satell ow-on to Do cy Integrate tional milita ces. The co and infrared be required ibits/day). Till comprise	of Defense ( ite program. DI's Defense d Program C rry command mverged proj cloud cover in sun synchi he European	DoD) and C The conve Meteorolog Hfice (IPO) lers and civi gram will be imagery and ronous 450 in Organizatio	ommerce (I rged prograt gical Satellite was establish lian leaders the nation's dother atmo un polar-orb on for the Ex of weather se	boC) and the nation, the Nation of the on 1 Oc imely, qualibriumly, qualibriumly, occipit at all time optimation of atellites. Night.	e National A onal Polar-or DMSP) and to 94 to mana ity weather ε urce of globε canographic, 28 (sun synch f Meteorologe ODESS succe	irects the Departments of Defense (DoD) and Commerce (DoC) and the National Aeronautics and Space-orbiting weather satellite program. The converged program, the National Polar-orbiting Operational ine the follow-on to DoD's Defense Meteorological Satellite Program (DMSP) and the DoC's Polar-orbitin A tri-agency Integrated Program Office (IPO) was established on 1 Oct 94 to manage the acquisition and vide operational military commanders and civilian leaders timely, quality weather and environmental infoonal resources. The converged program will be the nation's primary source of global weather and environide visible and infrared cloud cover imagery and other atmospheric, oceanographic, terrestrial, and space ellites will be required in sun synchronous 450 nm polar-orbit at all times (sun synchronous means the sate their 14 orbits/day). The European Organization for the Exploitation of Meteorological Satellites (EUME satellites, will comprise the Joint Polar System of weather satellites. NPOESS successfully completed Mil	nd Space tional lar-orbiting sition and tental information d environmental nd space ns the satellites se (EUMETSAT) soleted Milestone I
555555	\$647 Continued program office support for Program Definition and Risk Reduction efforts (PDRR). \$3,804 Continued government-led risk reduction and technology development efforts. \$4,500 Continued competitive system architecture studies. \$53,117 Continued critical sensor/algorithm development efforts and design/fabrication for risk reduction missions. \$62,068 Total	oort for Prog c reduction a architecture ithm develo	ram Definit und technolo studies. pment effor	ort for Program Definition and Risk Reduction reduction and technology development efforts. uchitecture studies. thm development efforts and design/fabrication	Reduction of the state of the s	efforts (PDR for risk redu	R). ıction missi	ons.		
<u>σ</u>	Project 644056		Page	Page 1 of 7 Pages				Ш	Exhibit R-2 (	Exhibit R-2 (PE 0603434F)

	RDT&E	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000	
8UDC <b>04 -</b>	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>		PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)		РКОЈЕСТ <b>644056</b>
<u>(2</u>	A. Mission Description Continued	Continued			
9	000 (\$ in Thousar	ઉ			
99	\$648 Co \$900 Co	Continue program office support for PDRR efforts.  Completed government-led risk reduction and technology development efforts.	velopment efforts.		
<u>(5)</u>	\$4,986 Co	Continue system architecture studies and ground system risk reduction to include competitive contracts between TRW and Lockheed Martin to definitize the NPOESS space and ground segment architectures.	reduction to include competitive contracts betwees.	en TRW and Lockheed Ma	urtin to
<u>(3</u>	\$52,646 Co	Continue critical VIIRS, CMIS, CrIS, OMPS, and GPSOS se for risk reduction missions.	CrIS, OMPS, and GPSOS sensor and associated algorithm development efforts and sensor design and fabrication	ts and sensor design and fal	brication
9	\$59,180 To	Total			
9	FY 2001 (\$ in Thousands)	(1)			
99	\$617 Co \$12,850 Co	Continue program office support for PDRR efforts.  Continue system definition contracts and ground system risk reduction to include competitive contracts between TRW and Lockheed Martin to	reduction to include competitive contracts betwee	en TRW and Lockheed Ma	rtin to
Ę	de:	definitize the NPOESS space and ground segment architectures.	d ground segment architectures.	to and company of the following	
9			abot and associated algorithm development citore	is ailt seilsoi tresigii ailt iat	OHCALIOH
9	\$76,654 To	Total			
	Acronyms: VIIRS - Visible/Infrared Imager/Sounder Suite	Imager/Sounder Suite			
	Critis - Conical intertowave imager/sounder Criss - Cross Track Infrared Sounder	ed Sounder			
	OMPS - Ozone Mapper and Profiler Suite GPSOS - Global Positioning System Occu	OMPS - Ozone Mapper and Profiler Suite GPSOS - Global Positioning System Occultation Sensor			
9	B. Budget Activity Justification This PE is in Budget Activity 4 (	<b>B. Budget Activity Justification</b> This PE is in Budget Activity 4 (Demonstration and Validation) because it currently supports sensor and satellite bus development.	y supports sensor and satellite bus development.		
Ω.	Project 644056	Page 2 of 7 Pages	Pages	Exhibit R-2 (PE 0603434F)	3434F)

	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)	t)	DATE Februa	February 2000
8UD( <b>04</b> -	вирсет астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)	olar-Orbiting ( te System (NF	Dperational	РРОЈЕСТ <b>644056</b>
(n)	C. Program Change Summary (\$\sin Thousands)	0001 AM	0000 753	1000 251	£ £
5	Previous President's Budget (FY 2000 PBR)	FT 1999 64.438	$\frac{F1}{80.137}$	113.234	2.041.958
3	Appropriated Value	64,732	60,137		0
3	Adjustments to Appropriated Value				
	a. Congressional/General Reductions b. Small Business Innovative Research	-294	<b>∞</b>		-302
	c. Omnibus or Other Above Threshold Reprogram		-480		-480
	d. Below Threshold Reprogram				
	e. Rescissions	-347	-469		-816
ďΩ	t. Other A dinetments to Budget Vears Since RV 2000 DRP			76 580	35 580
39	Current Budget Submit/FY 2001 PBR	62,068	59,180	76,654	2,001,757
5	Significant Program Changes: Funding: The FY01 reductions resulted from restructuring the program due to the FY00 congressional marks. FY01 funding for DMSP solid state recorders, which was previously included in the Multi-spectral Operational Linescan System (MOLS) risk reduction effort, was transfered to the DMSP program.	uring the program due to the FY00 congressional marks. FY01 funding for DMSP soli Linescan System (MOLS) risk reduction effort, was transfered to the DMSP program.	s. FY01 funding for insfered to the DMS	r DMSP solid state rec 3P program.	orders, which was
	Schedule: The sensor, ground system, and first satellite acquisition schedule three months from July 08 to Sept 08.	te acquisition schedule slipped due to FY00 congressional marks. The first satellite availability date has slipped	mal marks. The fir	st satellite availability .	date has slipped
	Technical: In FY00, combined system architecture studies with system definition and ground system risk reduction contracts. No additional funding required to complete this previously scheduled effort. Prior to FY00, NPOESS planned a Multi-spectral Operational Linescan System (MOLS) modification to DMSP's primary sensor to reduce risk to the NPOESS VIIRS sensor development, the VIIRS user segments, and provide a required enhancement to DMSP's primary operational sensor. Congressional marks in FY00 made this effort unaffordable and thus forced the termination of MOLS. To make-up for the loss of MOLS, development of the NPOESS's VIIRS data processing software was accelerated to permit real-time user exploitation of VIIRS data from the NPOESS Preparatory Program (NPP) mission. Therefore, the risk reduction activities and operational user enhancement that were to be provided by DMSP's MOLS will now be provided by NPP.	tion and ground system risk red I Multi-spectral Operational Lir iser segments, and provide a reche termination of MOLS. To me user exploitation of VIIRS dawere to be provided by DMSP.	fuction contracts. Nescan System (MC quired enhancementake-up for the loss at from the NPOEs will now by MOLS will now by the loss of the NPOEs will now by the NPOEs will not be the NPOEs will not be the NPOEs will now by the NPOEs will not be the NPOEs will now by the NPOEs will not be the NPOEs will not b	To additional funding races. MCS) modification to It to DMSP's primary of of MOLS, developments Preparatory Programs provided by NPP.	equired to DMSP's primary perational sensor. nt of the n (NPP) mission.
۵.	Project 644056	Page 3 of 7 Pages		Exhibit R-2 (	Exhibit R-2 (PE 0603434F)

	RDT&E BUDGET ITEM JU	ET ITE	M JUSTIF	CATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Exhi	ibit)		DATE February 2000	2000
900 <b>94</b>	вирсет астилту 04 - Demonstration and Validation	ation			PE NUMBER AND TITLE 0603434F Natio Environmental S	AND TITLE  Mational  nental Sat	PE NUMBER AND TITLE  0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)	oiting Ope em (NPOE	rational SS)	РRОЈЕСТ <b>644056</b>
(വ)	D. Other Program Funding Sumi	mary (\$ in ] FY 1999	Chousands) FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to	Total Cost
9	Related RDT&E: DMSP PE	Actual 19,983	Estimate 21,207	<u>Estimate</u> 25,372	<u>Estimate</u> 14,934	Estimate 11,882	Estimate 11,131	Estimate 11,396	<u>Complete</u> 22,057	955,279
9	Related RDT&E: DMSP PE 0305160N for Navy unique									
9	efforts Related NOAA PAC Funding: Polar Convergence* * National Oceanic and Atmospheric Administration Procurement, Acquisition, and Construction (NOAA PAC) appropriation. The Air Force (DoD) and NOAA (DoC) fund NPOESS 50/50.	ic Administ	ation Procuren	nent, Acquisiti	on, and Constr	uction (NOAA	л РАС) арргорі	riation. The	Air Force (DoD) and	I NOAA (DoC)
<b>9</b>	E. Acquisition Strategy The guiding tenets for NPOESS acquisition include accomplishing substantial risk reduction with a focus on payload development, enhancing data utility to users, deferring major system decisions as long as reasonable, and protecting maximum flexibility to ensure the best overall system design. The program pursues a significant investment in the development and on-orbit testing of selected payload sensors while deferring individual sensor selections among competing international, NASA, military, and industry alternatives to assess and determine the optimum technical performance potential of each candidate sensor. NPOESS is currently pursuing two missions to reduce sensor development and data user segment risk. The Windsat/Coriolis mission will prove technologies to be used for the NPOESS conical Microwave Imager/Radiometer Suite (VIIRS), the Cross Track Infrared Sounder (CrIS), and the Advanced Technology Microwave Sounder (ATMS). Overall system prime contractor selection is being deferred to minimize system level preliminary costs, allow sensor complement maturation, and delay the commitment to full system acquisition until approximately seven years before the first satellite need date. In FY00, eliminated the separate contract for system architecture studies due to contractor mergers. This effort will now be accomplished on the same contract as the ground system risk reduction efforts.  The NPOESS Executive Committee (EXCOM) has restructured the program twice since the Milestone I decision. The combined result of the first NPOESS satellites from January 2007 to July 2008. Congressional reductions to the FY00 budget for NPOESS forced another three month delay to the availability of the first NPOESS satellite. The first satellite should be available in time to fulfill the requirement to back-up the last of the DMSP or POES launches, whichever comes first. The IPO downselected two sensor development contracts during FY99. Ball Aerospace was avarded the DMSP in Decorated to be being the deci	quisition inc long as read on-orbit test o assess and rent and data her Cross Tr the Cross Tr dt to minimi en years bef complished complished e first NPO irst. The IP	lude accomplis sonable, and pring of selected determine the a user segment he NPOESS Prack Infrared Sone the first sat on the same conthe same contra	hing substanti otecting maxii I payload sens optimum techu risk. The Win eparatory Projounder (CrIS), I preliminary cellite need date ontract as the gontract	al risk reduction num flexibility ors while deferical performant disat/Coriolis nuch the Advan osts, allow sen in FY00, eli round system it twice since the fuly 2008. Conte should be averelopment connselected to bu	n with a focus to ensure the ring individua toe potential o nission will pr test-out three ced Technolog sor compleme minated the se isk reduction o Milestone I o gressional rec ailable in time ntracts during ild the Cross T	on payload debest overall sy. I sensor selectii feach candidat ove technologii of NPOESS's r. sy Microwave and maturation, aparate contract efforts.  I chillill the r. lecision. The coluctions to the I so fulfill the r. FY99. Ball Ae FY99. Ball Ae FY99. Ball Ae	velopment, er stem design. ons among co e sensor. NP es to be used nost complex Sounder (AT) and delay the for system a combined rest FY00 budget equirement to erospace was Sounder (CIS	omplishing substantial risk reduction with a focus on payload development, enhancing data utility to users, and protecting maximum flexibility to ensure the best overall system design. The program pursues a significant elected payload sensors while deferring individual sensor selections among competing international, NASA, ne the optimum technical performance potential of each candidate sensor. NPOESS is currently pursuing two gment risk. The Windsat/Coriolis mission will prove technologies to be used for the NPOESS Conical SSS Preparatory Project will fly and test-out three of NPOESS's most complex sensors: the Visible/Infrared ared Sounder (CrIS), and the Advanced Technology Microwave Sounder (ATMS). Overall system prime is level preliminary costs, allow sensor complement maturation, and delay the commitment to full system rists satellite need date. In FY00, eliminated the separate contract for system architecture studies due to contractor ame contract as the ground system risk reduction efforts.  Tuctured the program twice since the Milestone I decision. The combined result of the EXCOM's decisions has om January 2007 to July 2008. Congressional reductions to the FY00 budget for NPOESS forced another three slifte. The first satellite should be available in time to fulfill the requirement to back-up the last of the DMSP or selected two sensor development contracts during FY99. Ball Aerospace was awarded the production contract for Aerospace was downselected to build the Cross Track Infrared Sounder (CrIS) sensor. Also, in Dec 99 the IPO	to users, ss a significant al, NASA, ursuing two nical s/Infrared n prime system ue to contractor decisions has I another three the DMSP or tion contract for Dec 99 the IPO
Т	Project 644056			Pag	Page 4 of 7 Pages				Exhibit R-2 (PE 0603434F)	E 0603434F)

RDT&E BUDGET ITEM JUS	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)	PROJECT 644056 ESS)
(U) E. Acquisition Strategy Continued awarded competitive Program Definition and Risk Reduction contracts to TRW and Lockheed Martin.	ction contracts to TRW and Lockheed Martin.	
(U) E. Schedule Profile	FV 1999	FV 2001
	2 3 4 1 2 3	4 1 2 3 4
<ul> <li>(U) Program Rebaselined</li> <li>(U) Competitive Sensor Development Contracts Downselected</li> <li>(U) Award Competitive Program Definition &amp; Risk Reduction contracts</li> </ul>	* *	×
Project 644056	Page 5 of 7 Pages	Exhibit R-2 (PE 0603434F)

	RDT&E PROGRAM ELEMENT	RAM ELE	MENT/PR	I/PROJECT C	COST BR	BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	00
900 <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	/alidation			PE NUMBE 060343 Enviror	PE NUMBER AND TITLE 0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)	al Polar-O Itellite Sys	rbiting Opstern (NPC	oerational )ESS)	E 9	РРОЈЕСТ <b>644056</b>
(c)	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	(হা				ļ		, and a second	c	
9	Program Office Support for PDRR efforts	DRR efforts					FY 1999 647	1999 647	FY 2000 648	a	FY 2001 617
<u> </u>	<b>V</b> 1	Definition/Grou	nd System Risk	r Reduction			4, 9	4,500	4,986	10	12,850
39	Government Led Kisk Keduction/ Lechnology efforts Sensor/Algorithm Development and Design/Fabrication for Risk Reduction Missions/Program Support	tion/ lechnolog ent and Design/I	gy errorts Fabrication for l	Risk Reduction N	dissions/Prc	gram	53,	3,804 53,117	900 52,646		0 63,187
9	_						62,0	62,068	59,180		76,654
<u>E</u>	B. Budget Acquisition History and Planning Information (S in Thousands)	ry and Plannin	g Information	(S in Thousand	ଷ						
3	Performing Organizations:										
	Contractor or	Contract Method/Tyne	Award or	Performing	Project						
	Performing	or Funding	Obligation	Activity	Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Syst Arch Shidies C/Opt	Zations C/CPEF	Son 06	17 320	17 320	17.820	4 500			c	17 220
	TRW (PDRR)	C/FFP	Dec 99	10,609	10,609	12,020	2004	2,493	6,431	1.685	10,609
	Lockheed Martin (PDRR)	C/FFP	Dec 99	10,609	10,609			2,493	6,431	1,685	10,609
	Lockheed Martin	C/CPAF	Dec 94	4,597	4,597	4,489					4,489
	Raytheon (VIIRS & CrIS)	C/CPFF	Jul 97	26,181	26,181	8,407	10,945	6,829			26,181
	Ball Aerospace (CMIS & OMPS)	C/CPFF	Jul 97	24,961	24,961	3,498	10,068	6,179	5,216		24,961
	Ball Aerospace (OMPS)	C/CPAF	May 99	30,627	30,627			3,848	8,556	18,223	30,627
	ITT Aerospace (VIIRS &	C/CPFF	Jul 97	26,325	26,325	7,407	12,089	6,829			26,325
	Hughes Space and	C/CPFF	Jul 97	23,002	23,002	2,074	9,533	6,179	5,216		23,002
	Communications (CMIS)	נומניי	1.100	000	0,00		•				6
	Orbital Sciences (OlviPS)	CCFFF	/6 Inc	7,473	7,472	1,425	1,000				2,425
	Project 644056			Pag	Page 6 of 7 Pages	SS			Exhibit	Exhibit R-3 (PE 0603434F)	3434F)

	RDT&E PROGRAM ELEMENT		/PROJECT COST BREAKDOWN (R-3)	SOST BI	REAKDON	VN (R-3)		DATE Fe	February 2000	8
800 <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMB <b>06034</b> 3 <b>Enviro</b>	PE NUMBER AND TITLE  0603434F National Polar-Orbiting Operational Environmental Satellite System (NPOESS)	al Polar-O tellite Sys	rbiting Or stem (NPC	oerational ESS)		РRОЈЕСТ <b>644056</b>
(£)	Performing Organizations Continued: Product Development Organizations SAAB Ericsson (GPSOS) C/CPFF	Jul 97	2,786	2,786	2,386	400				2,786
		Aug 99 Aug 99	3,496 27,159	3,496 27,159			488 8,130	1,380 5,686	1,628	3,496 27,159
	Other follow-on contract MISC Government Led Studies Gov. Orgs.	Various Various	1,714,215	1,714,215	4,986 22,344	8,735	9,454 5,610	32,981 4,140	1,658,167 14,762	1,714,323
	Support and Management Organizations Integrated Program Office Various (IPO) Support  Test and Evaluation Organizations TBD	Various	26,438	26,438	13,464	647	648	617	11,062	26,438
5		Award or Obligation Date	Delivery Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	NOT APPLICABLE  Subtotals  Subtotal Product Development  Subtotal Support and Management  Subtotal Test and Evaluation				Total Prior to FY 1999 69,836 13,464	Budget FY 1999 61,421 647	Budget FY 2000 58,532 648	Budget FY 2001 76,037 617	Budget to Complete 1,709,493 11,062	Total Program 1,975,319 26,438
	Total Project		ć	ָר בי	83,300	62,068	59,180	76,654	1,720,555	2,001,757
	Project 644056		ŭ	rage / or / rages	žes			EXUID	EXNIBIT K-3 (PE 0603434F)	003434F)

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	RDT8	RDT&E BUDGET ITEM JU	_	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
8UD( <b>04</b> -	вирсет астилту 04 - Demonstration and Validation	and Validation			PE NUMBER AND TITLE 0603438F Space	AND TITLE <b>F Space</b>	PE NUMBER AND TITLE 0603438F Space Control Technology	Technol	ogy		PROJECT <b>642611</b>
	COST (\$ ii	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642611		Technology Insertion Planning and Analysis	7,212	12,621	9,728	9,717	669'6	9,679	9,658	Continuing	TBD
	Quantity of RDT&E Articles	Articles	0	0	0	0	0	0	0	0	0
Note:	: Congressional add re	Congressional add resulted in an Air Force new start i	in FY99.								
<u>5</u>	A. Mission Description This program supports a to support development prevention, and negation space for use in the Spac from enemy attempts to national security interest purposes hostile to U.S. temporary. localized, an	range of activities includin of tactics and procedures in n. Surveillance is the monite Control mission area. Prinegate or interfere. Preven s. Negation activities disruptiational security interests.	technology para Space Corring, detective cetion include on limits or exion, deny, degra	olanning, deratrol missior ug, identifyin les defensive liminates an de or destro th DoD poli	velopment, d n area. The t ng, tracking, e activities to n adversary's y an adversa cy, the negat	lemonstratic ypes of Spa assessing, v protect U.! ability to us ry's space sy	ons and prote ce Control a rerifying, cat 3, and friend ie U.S. space /stems, or th of this progra	ryping, as v ctivities acc egorizing, a ly space-sys : systems an e informatic	vell as mode omplished a nid character stems assets, id services from they provily on negatinals.	ling, simulat re surveillan izing, object resources, a or purposes h ide, which m	g technology planning, development, demonstrations and prototyping, as well as modeling, simulations and exercises the Space Control mission area. The types of Space Control activities accomplished are surveillance, protection, toring, detecting, identifying, tracking, assessing, verifying, categorizing, and characterizing, objects and events in otection includes defensive activities to protect U.S. and friendly space-systems assets, resources, and operations tion limits or eliminates an adversary's ability to use U.S. space systems and services for purposes hostile to U.S. ot, deny, degrade or destroy an adversary's space systems, or the information they provide, which may be used for Consistent with DoD policy, the negation efforts of this program focus only on negation technologies which have
9999	EY 1999 (\$ in Thousands) \$480 Dev \$1,350 Dev \$770 Dev	ands)  Developed Space Control mission area requirements for the Air Force Space Surveillance Network.  Developed technologies for protection of space assets.  Developed techniques to prevent unauthorized use of next generation counter-navigation signals.	sion area req otection of sp ent unauthori	uirements for a sassets. Zed use of n	or the Air Fo ext generatio	rce Space S	urveillance l avigation sig	Vetwork. gnals.			
99	\$4,612 \$7,212	Developed technologies to counter surveillance, reconnaissance, and communications satellite systems. Total	nter surveill	ance, reconn	iaissance, an	d communic	cations satell	ite systems.			
999	EY 2000 (\$ in Thousands) \$1,450 Det \$2,320 Det	ands)  Determine surveillance system deficiencies to meet Space Control requirements and assess technologies to satisfy mission needs.  Determine space system protection deficiencies. Assess requirements for protection of U.S. space systems and potential technologies to achieve required threat warning and attack reporting.	deficiencies tion deficier ack reporting	to meet Sparcies. Asses	ace Control r	equirement its for prote	s and assess ction of U.S	technologie . space syst	s to satisfy n erns and pot	nission needs ential techno	s. ologies to achieve
99	\$8,851 \$12,621	Continue to develop technologies to counter surveillance, reconnaissance, and communications satellite systems. Total	ies to counte	r surveilland	ce, reconnais	sance, and o	communicati	ons satellite	systems.		

Page 1 of 5 Pages

Project 642611

Exhibit R-2 (PE 0603438F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2 Exhibit	t)	DATE February 2000	000
BUDGI <b>04 -</b>	BUDGET ACTIVITY 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603438F Space Control Technology	trol Technology	۸	РРОЈЕСТ <b>642611</b>
( <u>n</u> )	A. Mission Description Continued				
<u> </u>	<ul> <li>EY 2001 (\$ in Thousands)</li> <li>\$810</li> <li>Develop potential technical solutions to address surveillance system deficiencies and identify the most promising technologies to pursue.</li> <li>\$900</li> <li>Develop potential technical solutions to address space system protection shortfalls. Develop potential technical solutions to address threat</li> </ul>	illance system deficiencies and is system protection shortfalls. De	dentify the most prome evelop potential techniques	nising technologies to pur ireal solutions to address t	sue. threat
999	\$700 Assess current space systems and other program elements to ensure all aspects of clarified prevention definition are being addressed.  \$7,318 Continue to develop technologies to counter surveillance, reconnaissance, and communications satellite systems.  \$9,728 Total	reporting architecture and most lents to ensure all aspects of clari- ice, reconnaissance, and commu	fred prevention defini nications satellite syst	es to pursue. ition are being addressed. tems.	
9	B. Budget Activity Justification  This program is in budget activity 4 - Demonstration and Validation, because it supports the research, demonstration, and validation of Space Control technologies.	e it supports the research, demon	stration, and validatio	on of Space Control techn	ologies.
9	C. Program Change Summary (\$\sumsymbol{S}\$ in Thousands)				,
<u>(</u>	Previous President's Budget (FY 2000 PBR)	7,479	9,822	57 2001 9,814	Total Cost TBD
<u>(5)</u>	Appropriated Value	7,500	12,822		
9	Adjustments to Appropriated Value 2 Congressional/General Reductions	16-	0		
	b. Small Business Innovative Research	-227	0		
	c. Omnibus or Other Above Threshold Reprogram	0	-102		
	d. Below Threshold Reprogram	0	0		
	e. Rescissions f Other	-40 0	66 <b>-</b>		TRD
56	Adjustments to Budget Years Since FY 2000 PBR	0	0	-86	Cat
9 9	Significant Program Changes: FY01 -\$86K for higher priority Air Force programs		100		
P	Project 642611	Page 2 of 5 Pages		Exhibit R-2 (PE 0603438F)	)603438F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	M JUSTIF	CATION	SHEET	(R-2 Exhi	bit)		DATE February 2000	y 2000
BUDGE <b>04 - C</b>	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>			PE NUMBER AND TITLE 0603438F Space	AND TITLE  Space C	PE NUMBER AND TITLE 0603438F Space Control Technology	hnology		PROJECT <b>642611</b>
<b>a</b> (Ɗ)	D. Other Program Funding Summary (\$ in Thousands)  FY 1999  FY 2000  Actual  Estimate	Chousands) FY 2000 Estimate	Extimate	FY 2002 Estimate	FY 2003 Estimate	EY 2004 Estimate	EY 2005 Estimate	Cost to Complete	Total Cost
х Э	Not Applicable								
(J)	E. Acquisition Strategy Use the Air Force's modernization planning process to better define surveillance and protection technologies for study and for possible development in FY 2002 and beyond. This PE will influence Air Force Research Laboratory technology, Space and Missile System Center systems, and Electronic Systems Center space surveillance, investments. Technologies to address counter surveillance, reconnaissance, and communications will be investigated toward capabilities identified in the AFSPC space control mission area plan.	cess to better d arch Laborator urveillance, rec	efine surveilla y technology, S onnaissance, a	nce and protect pace and Miss nd communics	tion technolog sile System Ce rtions will be i	ies for study an nter systems, a nvestigated to	nd for possible ind Electronic ward capabilit	e development in F Systems Center st ies identified in the	'Y 2002 and pace surveillance e AFSPC space
(U) E	F. Schedule Profile								
			-	EY 1999 2 3	4	EY 2000	, , , ,	,  - 	EY 2001
9 (S)	SecDef Report to Congress Air Force Space Control Technology Plan Approved AFSPC Space Control Mission Area Plan Completion * = Completed Event X = Scheduled Event	oved oletion			*	*			
Proj	Project 642611		Pag	Page 3 of 5 Pages				Exhibit R-2 (PE 0603438F)	PE 0603438F)
				441					

	RDT&E PROGRAM ELEMENT	3RAM ELE		/PROJECT CO	OST BF	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	8
BUI <b>9</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	Validation			PE NUMBER AI <b>0603438F</b>		Control Te	ыр тп∟е Space Control Technology		14 <b>U</b>	PROJECT <b>642611</b>
(1)	A. Project Cost Breakdown (\$ in Thousands)	n (\$ in Thousan	<b>(Sp</b>				FV 1000	000	FV 2000	Q	FV 2001
<u> </u>		essment					4 ,	480	1,450	31 Q 9	758
<u> </u>		sment lopment and defi	inition					1,350	2,320	0 0	1,668
<u> </u>	<ul><li>Negation technology development</li><li>Total</li></ul>	pment					7,7	4,612 7,212	8,851 12,621		6,745 9,728
<u>e</u>	B. Budget Acquisition History and Planning Information (\$\mathcal{S}\$ in Thousands)	ory and Plannii	ıg Informatic	on (S in Thousand	<u> </u>						
9	_, _										
	Covernment	Contract Method/Type	Award or	Performing	Project						
	Performing Activity	or Funding Vehicle	Obligation Date	Activity EAC	Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Product Development Organizations	uzations								•	•
	SMC	Various				0 0	7,082	4,771	4,854	Continuing	TBD
	Support and Management Organizations	reanizations				>	>	1,120	ŕ	Commung	777
	SMC	Various				0	130	130	130	Continuing	TBD
	Test and Evaluation Organizations TBD	zations									
9	Government Furnished Property:	operty:									
		Contract Method/Type	Award or								
	<u>Item</u> Description	or Funding Vehicle	Obligation Date	<u>Delivery</u> Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Product Development Property	Litz				•				ı	
	Support and Management Property None	toperty									
	Project 642611			Page	Page 4 of 5 Pages	se.			Exhib	Exhibit R-3 (PE 0603438F)	03438F)

RDT&E PROGRAM ELEMENT/PROJEC	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	0
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603438F Space Control Technology	Control To	echnology		P P P	PROJECT <b>642611</b>
(U) Government Furnished Property Continued:  Test and Evaluation Property  None						
Subtotals Subtotal Product Development Subtotal Support and Management	<u>Total Prior</u> to <u>FY 1999</u> 0	Budget EX 1999 7,082 130	Budget EY 2000 12,491 130	Budget FY 2001 9,598 130	Budget to Complete TBD TBD	Total Program TBD TBD
Subtotal Test and Evaluation  Total Project	0	7,212	12,621	9,728	TBD	TBD
Project 642611	Page 5 of 5 Pages			Exhibi	Exhibit R-3 (PE 0603438F)	3438F)

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L	 RDT8	RDT&E BUDGET ITEM JU	JSTIFIC	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 E)	chibit)		DATE	February 2000	0000
BUDG	BUDGET ACTIVITY				PE NUMBER	PE NUMBER AND TITLE					PROJECT
04 -	Demonstration	04 - Demonstration and Validation			0603441F		Based I	R Arch (	Space Based IR Arch (Dem Val)(Space)	)(Space)	640007
	COST (\$	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
640007	7 SBIRS Low		144,723	0	0	0	0	0	0	0	1,154,120
	Quantity of RDT&E Articles	E Articles	0	0	0	0	0	0	0	0	0
9	A. Mission Description  (U) The Space-Based Infrar SBIRS will incorporate new tracking and discrimination of Command's Capstone Requi Elliptical Orbits (HEO) and (DSP) satellites. SBIRS Lov Program Definition contracts and Development (EMD) sta 99 and the program restructu Altitude Demonstration Syst efforts for operational requir	A. Mission Description  (U) The Space-Based Infrared System's (SBIRS) primary mission is to provide initial warning of a ballistic missile attack on the US, its deployed forces or its allies. SBIRS will incorporate new technologies to enhance detection; improve reporting of ICBM, SLBM and tactical ballistic missiles; and provide critical mid-course tracking and discrimination data for national and theater missile defense. This system will provide increased performance in order to meet requirements in US Space Command's Capstone Requirements Document. SBIRS will consist of satellites in Geosynchronous Orbits (GEO), Highly Elliptical Orbits (HEO) and Low Earth Orbits (LEO) and an integrated centralized ground station serving all SBIRS space elements and Defense Support Program (DSP) satellites. SBIRS Low is the Low Earth Orbit (LEO) component of SBIRS. PE 305911F funds DSP and PE 604441F funds SBIRS High EMD activities. Program Definition contracts for the operational SBIRS Low system were awarded in August 1999 leading to a Milestone II decision and Engineering, Manufacturing and Development (EMD) start in 1QFY03. Subsequent to the formulation of the FY00 President's Budget, the flight demonstration contracts were terminated on 5 Feb 99 and the program restructured to provide for an expanded Program Definition and Risk Reduction (PDRR) phase. The Flight Demonstration System (FDS) have provided valuable lessons learned and risk reduction. Results of these demonstrations will support the Program Definition PG004442F for PDRR efforts.	nary mission detection; in ter missile deperations R and an integ (LEO) comp (S Low syst nt to the formanded Prograd valuable I and system is and system	is to provi aprove repo efense. Thi equirements rated centra onent of SE em were aw nulation of am Definiti essons lear	de initial wanting of ICB is system wil is Specument.  alized ground  3IRS. PE 30  arded in Au, the FY00 Pr. the FY00 Pr. the FY00 Pr. the FY00 Pr. the dead and risk.	ming of a be M, SLBM a II provide in SBIRS will station services 1991 IF fund gust 1999 Ie esident's Bu Reduction (reduction. R	illistic missil nd tactical borceased performing all SBIF s DSP and P ading to a M dget, the flig PDRR) phas esults of the ends for the ends for the	le attack on allistic miss ormance in of atellites in (S space ele E 604441F filestone II of the demonstrate. The Fligse elementation of the filestone of the demonstrate. The Fligse elementation of the filestone of the fileston	the US, its corder to mee Geosynchror ments and prements and prements and Linds SBIR; decision and ration contractions will stations will some DRR contractions will some methods.	leployed forcy wide critical 1 st requirement tous Orbits (C Defense Supp S High EMD Engineering, tots were term ration System support the Pr	es or its allies. mid-course its in US Space JEO), Highly ort Program activities. Manufacturing innated on 5 Feb (FDS) and Low ogram Definition opriated in PE
<u> </u>	FY 1999 (\$ in Thousands) \$74,000 FD; \$33,992 LA \$15,359 Pro \$1,650 Sin \$5,502 FD;	eands) FDS LADS Program office activities. Simulation / Discrimination FDS and LADS Support-Range	e support, la	unch servic	support, launch services, TMD Targets (includes termination costs)	rgets (includ	es terminatio	on costs)			
9999	\$9,846 \$774 \$3,600 \$144,723	Technologies Space Study Increment 3 System of Systems Total	S								
Ą.	Project 640007			Page	Page 1 of 5 Pages	S				Exhibit R-2 (	Exhibit R-2 (PE 0603441F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2 Exhibi	it)	DATE February 2000	y 2000
8UD <b>04</b>	вирсет аститу <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem Val)(Space)	sed IR Arch (I	Jem Val)(Space)	PROJECT <b>640007</b>
9	A. Mission Description Continued				
993	FY 2000 (\$ in Thousands) \$0 No Activity \$0 Total				
999	EY 2001 (\$ in Thousands) \$0 No Activity \$0 Total				,
9	B. Budget Activity Justification This program is funded in Budget Activity 4, Demonstration and Validation, because it funds risk reduction and advanced technology demonstrations.	because it funds risk reduction	and advanced tech	nology demonstrations.	
9	C. Program Change Summary (\$\sumsymbol{s}\) in Thousands)				
555	Previous President's Budget (FY 2000 PBR) Appropriated Value	<u>FY 1999</u> 159,008 160,262	EY 2000 151,378 0	FY 2001 113,242	<u>Total Cost</u> 1,433,025
9	Adjustificitis to Appropriated value a. Congressional/General Reductions b. Small Business Innovative Research	-1,254 -5,261			
	c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions f. Other	-8,215			
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR	144,723	0	-113,242 0	-278,905 1,154,120
<u>(</u>	Significant Program Changes: Funding this program element to complete the flight demonstration appropriated in PE 0604442F. The FY01 funds were moved to PE 0604442F for the same purpose.	element to complete the flight demonstration contracts are required for the expanded PDRR contracts and were oved to PE 0604442F for the same purpose.	acts are required fo	r the expanded PDRR con	itracts and were
<u> </u>	Project 640007	Page 2 of 5 Pages		Exhibit R-2 (PE 0603441F)	E 0603441F)

	RDT&E BUDGET ITEM JU	GET ITE		ICATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Exh	ibit)		DATE February 2000	y 2000
BUD <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	idation			PE NUMBER AND TITLE 0603441F Space	AND TITLE F Space E	ased IR A	rch (Dem	⊌DTITLE Space Based IR Arch (Dem Val)(Space)	PROJECT <b>640007</b>
(0)	D. Other Program Funding Summary (\$ in Thousands)  EY 1999  EY 2000	mmary (\$ in T FY 1999 Actual	Thousands) EY 2000 Estimate	EY 2001 Estimate	FY 2002 Ferimate	FY 2003 Estimate	FY 2004 Ferimate	FY 2005 Estimate	Cost to	Total Cost
(3)	PE #35922F - SBIRS Low	0	0	0	0	33,100	101,400	328,390	Continuing	TBD
99	Frod Related RDT&E: PE #604441F - SBIRS High	508,473	420,476	569,188	389,879	196,841	128,871	100,856	356,475	3,492,030
93	EMD PE #305911F - DSP PE #60442F - SBIRS Low EMD	13,971 36,627	7,361 225,566	11,462 241,021	6,418 306,530	6,697 617,662	0 763,362	0 486,840	0 513,647	1,923,990 3,191,255
9	E. Acquisition Strategy  (U) The SBIRS program is managed through a single consolidated System Program Office (SPO) at the Space and Missile Systems Center, Los Angeles, Air Force Base, CA. SBIRS Low began Program Definition activities in Aug 99 with the award of two firm fixed price contracts. Program Definition will be followed by a competitive contract award for EMD planned in IQFY03 with SBIRS Low satellite deployment starting in 4QFY06.	ged through a to Definition act in IQFY03 wi	single consolid ivities in Aug ! th SBIRS Low	ated System P. 99 with the aw reatellite deplo	nsolidated System Program Office (SPO) at the Aug 99 with the award of two firm fixed price S. Low satellite deployment starting in 4QFY06.	(SPO) at the S 1 fixed price α ; in 4QFY06.	pace and Miss ontracts. Progr.	ile Systems C am Definition	enter, Los Angeles will be followed b	s, Air Force Base,
9	F. Schedule Profile			-	EY 1999		, <u>E</u>	EY 2000	, E	FY 2001
<u> </u>	(U) Program Definition Contract Award	ard		-		<b>†</b> *	7		7	
ш.	Project 640007			Pap	Page 3 of 5 Pages				Exhibit R-2 (F	Exhibit R-2 (PE 0603441F)

	RDT&E PROGRAM ELEMENT	RAM ELE		/PROJECT C	OST BF	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fet	February 2000	00
BUE <b>04</b>	вирсет астилту 04 - Demonstration and Validation	/alidation			PE NUMBER AI <b>0603441F</b>	_	וסדודנה Space Based IR Arch (Dem Val)(Space)	Arch (Den	n Val)(Spa		РРОЈЕСТ <b>640007</b>
9	A. Project Cost Breakdown (\$ in Thousands)	(S in Thousang	(SI				FV 1000	000	FV 2000	_	FV 2001
9	Flight Demonstration System						74,000	3 00	0	<b>S</b>	0
3		System (LADS)					33,992	365	0		0
3	-						3,6	9,846	0		0
3							15,359	359	0		0
9	Simulation and Discrimination	ų.					1,6	1,650	0		0 0
999		ns					3,6	3,502 3,600 774	0		0
3							144,723	723	0		0
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannin	g Information	(\$ in Thousand	<del>ds</del> )						
3	Performing Organizations:										
	Contractor or	Contract									
	Government	a	Award or	<u>Performing</u>	<b>Project</b>						
	Performing Activity	or Funding Vehicle	Obligation Date	Activity EAC	Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Product Development Organizations	zations									
	FDS - TRW	C/CPAF	May 95	TBD	686,951	611,893	74,000	0	0	0	685,893
	LADS - Boeing	SS/CPFF	Sep 96	TBD	208,136	170,744	33,992	0	0	0	204,736
	Non-Flyer Demo Work-	C/CPAF	May 95	130,643	130,643	130,643	0	0	0	0	130,643
	Rockwell International										
	Misc. Contracts	Various	Various	TBD	TBD	39,551	18,728	0	0	0	58,279
	Support and Management Organizations	ganizations									
	Aerospace		Various	N/A	N/A	33,907	11,315	0	0	0	45,222
	SETA/SPO Support	Various	Various	N/A	N/A	22,659	5,040	0	0	0	27,699
	Test and Evaluation Organizations	tions									
	NMD Targets						1,648	0	0	0	1,648
	Project 640007			Paş	Page 4 of 5 Pages	;es			Exhibit	Exhibit R-3 (PE 0603441F)	303441F)

RDT&E PROGRAM ELEMENT		/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	8
BUDGET ACTIVITY  O4 - Demonstration and Validation		PE NUMBER AND TITLE 0603441F Space Based IR Arch (Dem Val)(Space)	Based IR	Arch (Den	n Val)(Sp		PROJECT <b>640007</b>
(U) Government Furnished Property:  Contract Method/Type Item or Funding Description Vehicle Product Development Property Not Applicable Support and Management Property Test and Evaluation Property	Award or Obligation Delivery Date Date	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project		Total Prior to FY 1999 952,831 56,566 1,009,397	Budget FY 1999 126,720 16,355 1,648 144,723	Budget FY 2000 0 0 0 0	Budget EY 2001 0 0 0 0	Budget to Complete 0 0 0 0	Total Program 1,079,551 72,921 1,648 1,154,120
Project 640007		Page 5 of 5 Pages			Exhibi	Exhibit R-3 (PE 0603441F)	03441F)

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PE NUMBER: 0603617F
PE TITLE: Command Control and Communication Applications

	RDT&E BUDGET ITEM JU	JSTIFIC	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
BUDGET ACTIVITY  04 - Demons	BUDGET ACTIVITY 04 - Demonstration and Validation			PE NUMBER AND TITLE 0603617F Comr Applications	AND TITLE F Commi	nand Cor	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	Commu	nication	
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	8,234	692'2	7,828	7,936	8,068	8,228	8,392	Continuing	TBD
642314	Tactical Air Surveillance	444	446	448	452	458	466	476	Continuing	TBD
642317	Tactical Air Information Production & Distribtion	3,047	3,075	3,097	3,142	3,194	3,257	3,323	Continuing	TBD
642321	Tactical Battle Information Management	4,540	4,029	4,060	4,109	4,177	4,261	4,346	Continuing	TBD
643804	Tactical Air Forces Systems Integration	203	219	223	233	239	244	247	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

# (U) A. Mission Description

integrates and supports fielding of joint mission critical software applications to the Theater Battle Management Core Systems and the Air Force Global Command and Control System. The program develops, integrates and validates information distribution and assurance technologies in the areas of enterprise network management and responsive to operational requirements for improved battle management, communications, theater missile defense (TMD), and surveillance capability. This program takes advantage of advanced information technology developments throughout the services and industry as well as off-the-shelf technology. The program develops, This program is designed to rapidly transition development efforts in the science and technology base directly to warfighting commands. Projects are directly control, defensive information warfare, and communications connectivity required for modernization and improvement of the Air Force Global Grid.

# (U) B. Budget Activity Justification

This program is in Budget Activity 4, Demonstration and Validation, because its products are primarily advanced development models, rapid prototype efforts, and software developed through evolutionary acquisition methods.

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Exhibit R-2 (PE 0603617F)

451

Per Nuiveer Activity   Applications   Applications   Per Nuiveer Start Thousands   Per Nuive		RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2 Exhibit	£	DATE February 2000	8
C. Program Change Summary (S in Thousands)         FY 1999         FY 2000         FY 2001           Previous President's Budget (FY 2000 PBR)         7,731         7,833         7,898           Appropriated Value         -39         7,770         7,833         7,898           Adjustments to Appropriated Value         -39         -39         -64         -7,898           a. Congressional/General Reductions         -208         -64         -64         -7,64           b. Small business Innovative Research         -56         -64         -7,64         -7,64           c. Omnibus or Other Above Threshold Reprogram         -6.4         -7,64         -7,64         -7,64           c. Recissions         -6.4         7,769         7,828         -7,60           Adjustments to Budget Years Since FY 2000 PBR         8,234         7,769         7,828           Significant Program Changes:         Significant Program Changes:         Ewhibit R-2 (PE 060	8UD <b>04</b>	зет астіvіту · Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Applications	Control and Co	mmunication	
Previous President's Budget (FY 2000 PBR)  Privator Advancable	(c)	C. Program Change Summary (\$ in Thousands)	0001 784	0000 281	1000 / 244	C
Adjustments to Budget Years Since FY 2000 PBR Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR Significant Program Changes:  Significant Program Changes:  Page 2 of 20 Pages Exhibit R-2 (PE 0603641)	555	Previous President's Budget (FY 2000 PBR) Appropriated Value Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions	FY 1999 7,731 7,770 -39 -208 756 -45	FY 2000 7,833 7,833 -64	FY 2001 7,898	Total Cost
Significant Program Changes:  Page 2 of 20 Pages.	99	<ol> <li>Uther         Adjustments to Budget Years Since FY 2000 PBR         Current Budget Submit/FY 2001 PBR     </li> </ol>	8,234	7,769	-70 7,828	TBD
	<u>5</u>	Significant Program Changes:				
		Pag	2 of 20 Pages		Exhibit R-2 (PE 060	03617F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFIC,	ATION S	SHEET (	R-2A E	xhibit)	:	DATE	February 2000	v 2000
8UDG <b>04 -</b>	вирсет астіліту 04 - Demonstration and Validation			PE NUMBER AND TO 10603617F Co. Applications	PE NUMBER AND TITLE 0603617F Comn Applications	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	ıtrol and	Commu	nication	PROJECT <b>642314</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642314	4 Tactical Air Surveillance	444	446	448	452	458	466	476	Continuing	TBD
<b>(</b> 2)	A. Mission Description Develops and demonstrates advanced aerospace surveil and/or adjunct radar sensors to address the Combat Air	eillance tech ir Forces (C	nology in su AF) surveill	pport of nex ance, detect	t generation on, tracking	sensors and	sensor sign	al processin	llance technology in support of next generation sensors and sensor signal processing. Investigates non-radar Forces (CAF) surveillance, detection, tracking and identification requirements not satisfied by an active rad	lance technology in support of next generation sensors and sensor signal processing. Investigates non-radar Forces (CAF) surveillance, detection, tracking and identification requirements not satisfied by an active radar.
5555	<ul> <li>EX 1999 (\$ in Thousands)</li> <li>\$265 Continued Track Before Detect for TMD</li> <li>\$179 Initiated Ground Theater Air Control System (GTACS) Bistatic/Electronic Support Measures (ESM) System Definition</li> <li>\$444 Total</li> </ul>	t for TMD Control Syste	ım (GTACS	) Bistatic/El	ectronic Sup	port Measur	es (ESM) S	ystem Defin	ition	
<u> </u>	<ul> <li>EY 2000 (\$\\$\frac{1}{2}\$ in Thousands)</li> <li>\$203 Complete Track Before Detect for TMD</li> <li>\$166 Complete GTACS Bistatic/ESM System Definition</li> <li>\$77 Initiate GTACS Bistatic/ESM ground demonstration</li> <li>\$446 Total</li> </ul>	for TMD M System D ground dem	efinition onstration							
5555	FY 2001 (\$\sum_{\text{in Thousands}}\) \$178 Complete GTACS Bistatic/ESM ground demonstratio \$270 Initiate GTACS Bistatic/ESM airborne demonstration \$448 Total		ground demonstration rborne demonstration	-						
Ð	B. Project Change Summary Not applicable									
፵	Project 642314		Page	Page 3 of 20 Pages	Se			Û	thibit R-2A (F	Exhibit R-2A (PE 0603617F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	ET ITEN		ICATION	SHEET (	R-2A Ext	lbit)	Ď	DATE Fobrishy 2000	0000
8UD <b>04</b>	вирсет Астіvіту 04 - Demonstration and Validation	ation			PE NUMBER AND TITLE 0603617F Comn Applications	AND TITLE F Comma	nd Control	and Com	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	PROJECT 642314
<u>e</u>	C. Other Program Funding Sumi	nary (\$ in T FY 1999	housands) FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	Cost to	Total Cost
9	RDT&E, AF (0603789F,	Actual 6,583	Estimate 10,851	Estimate 9,788	Estimate 8,526	Estimate 7,591	Estimate 7,750	Estimate 7,911	Complete Continuing	TBD
5	Froject 497.2) RDT&E, AF (0207412F, Project 485L)	423	467	450	436	426	435	375	Continuing	TBD
3	<b>D. Acquisition Strategy</b> All contracts in this project are awarded in full competition and are Cost Plus Fixed Fee (CPFF) or Cost Plus Award Fee (CPAF) as appropriate for advanced development.	rded in full c	ompetition an	ıd are Cost Plus	Fixed Fee (Cl	PFF) or Cost F	lus Award Fee	(CPAF) as ap	propriate for advan	pəo
9	E. Schedule Profile				EY 1999		EX 2000	000	FY 2001	2001
999	Track Before Detect for TMD GTACS Bistatic/ESM System Definition GTACS Bistatic/ESM Ground Demo Note: * represents a completed event; X represents a planned event.	nition no nt; X repress	ents a planned	l event.	3	4	-	1 € ×	2	£ X
D.	Project 642314			Page	Page 4 of 20 Pages				Exhibit R-2A (PE 0603617F)	= 0603617F)
					757					

	RDT&E PROG	PROGRAM ELEMENT		/PROJECT CO	OST BE	COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fel</b>	February 2000	000
9UE <b>9</b>	вирсет астилту 04 - Demonstration and Validation	/alidation			PE NUMBER AND TO 0603617F Co	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	and Contr	ol and Co	mmunica	tion	РКОЈЕСТ <b>642314</b>
(£)	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	(হ্				EV 1000	000	EV 2000	-	FV 2001
9	Primary Hardware Development	ent					] '''	390	394	⇒ı	415
33	Government Engineering Support Total	port					4	54 444	52 446		33
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannin	g Information	(\$ in Thousands	ନ						
3	•										
	Contractor or Government	Contract Method/Type	Award or	Performing	Project						
	Performing	or Funding	Obligation	Activity	Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity Product Development Organizations	<u>Vehicle</u> zations	Date	TEAC	PEAC	to FY 1999	F X 1999	FX 2000	FY 2001	Complete	Program
	Hughes	C/CPFF	June 95	1,179	1,179	1,179	0	0	0	0	1,179
	DSA	Tsk Ordr	Apr 97	502	505	502	0	0	0	0	505
	Northrop-Grumman	Agmt Tsk Ordr	Aug 98	488	488	0	287	204	0	0	491
		Agmt	dar	770	770	c	o	166	c	c	370
	TBD	TBD	TBD	107	t07 0	0	0	100	390	O Continuing	TBD
	Support and Management Organizations	zanizations Tr. Leane	· \$	V/N	<b>4/14</b>	6.410	04	7.	05		Tat
	Miscellaneous	Various	Various	N/A	N/A	0,47	g 0	<u>,</u> 0		Continuing	TBD
	Test and Evaluation Organizations	tions								•	
	Project 642314			Page	Page 5 of 20 Pages	zes			Exhibit	Exhibit R-3 (PE 0603617F)	603617F)

RDT&E PROGRAM ELEMENT/PROJECT C	I/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	٥
BUDGET ACTIVITY	PE NUMBER AND TITLE					PROJECT
04 - Demonstration and Validation	0603617F Command Control and Communication Applications	and Contr	ol and Co	mmunica		642314
Subtotals Subtotal Product Development	Total Prior to FY 1999 1,681	Budget FY 1999 386	Budget FY 2000 389	Budget FY 2001 390	Budget to Complete TBD	Total Program TBD
Subtotal Support and Management Subtotal Test and Evaluation Total Project	6,419 8,100	58 444	<i>57</i> 446	58 448	TBD	TBD
Project 642314 Pag	Page 6 of 20 Pages			Exhibit	Exhibit R-3 (PE 0603617F)	3617F)

	RDT&E	RDT&E BUDGET ITEM JU	STIFIC/	ATION 8	STIFICATION SHEET (R-2A Exhibit)	R-2A E	xhibit)		DATE		February 2000
BUDG <b>04 -</b>	вирсет астіvіту <b>04 - Demonstration and Validation</b>	and Validation			PE NUMBER AND TO 10603617F Co	PE NUMBER AND TITLE 0603617F Comr Applications	nand Cor	ntrol and	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	nication	PROJECT <b>642317</b>
	COST (\$ in	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642317		Tactical Air Information Production & Distribtion	3,047	3,075	3,097	3,142	3,194	3,257	3,323	Continuing	TBD
Ð	A. Mission Description Integrates, demonstrates an Command and Control Systemonstration processes (e. In coordinating with the str demonstrate/validate the tra Communication Relay (AC capabilities for C2 enterprisinto AF enterprise systems.	A. Mission Description Integrates, demonstrates and transitions advanced information assurance and distribution technologies to acquisition organizations in support of the Integrated Command and Control System (IC2S). The goal is the creation of an assured, global information grid to support the warfighter and to support experimentation and demonstration processes (e.g. IEFX) to reduce the risk of transitioning advanced government or commercial information technologies into military enterprise systems. In coordinating with the strategic planning activities of AF/SC, AC2ISRC, HQ ESC, AFCA, ACC and AMC this project has been reorganized to more effectively demonstrate/validate the transition of AFRL technology into AF planned product acquisitions. The three program focus areas included in this project are; the Airborne Communication Relay (ACR) which provides for robust communications connectivity, the AF Comprehensive Enterprise Management (ACEM) which provides capabilities for C2 enterprise network management and control, and the AF Enterprise Defense (AFED) which incorporates defensive information assurance capabilities into AF enterprise systems.	ormation ass e creation of k of transition of AF/SC, A gy into AF I ust commun nd control, an	urance and an assured, an assured, oning advan C2ISRC, Holanned procietions cornd the AF E	distribution t global infor ced governm Q ESC, AFC duct acquisiti mectivity, th	echnologies mation grid tent or com 'A, ACC an ions. The th e AF Compi fense (AFE)	s to acquisitic to support the nercial infort d AMC this J uree program rehensive En	on organizal he warfighte mation tech project has l focus areas iterprise Ma	tions in supp rand to supl nologies into been reorgan included in nagement (A	oort of the Int port experim omilitary ent ized to more this project ( ACEM) which	regrated entation and terprise systems. effectively are; the Airborne h provides urance capabilities
<u> </u>	EY 1999 (\$ in Thousands) \$441	tinued the airborne-transputinue UAV radio electrom tinue the airborne-transpoi iate the trransition of advanware into deployable capaliate development of advanciate effort to transition and lications al	ortable radio agnetic inter table radio v teed develop sility at Lang sed, wideban demonstrate eband/multil a placement PA and prep logy to impr	wideband/r ference/con wideband P ment Projec gley AFB, V id suitcase s ithe (Proj 4; the (Proj 4; and antem issues for A are for trans ove perform	agnetic interference/compatibility research and test for a communications rable radio wideband/multi-band antenna development table radio wideband Power Amplifier (PA) development oced development Project 2335 error mitigation hardware/software and desility at Langley AFB, VA ced, wideband suitcase satellite communications (SATCOM) capability demonstrate the (Proj 4519/DARPA) On Board Switch (OBS) technology demonstrate the (Proj 4519/DARPA) On Board Switch (OBS) technology apparement issues for ACN platform  PA and prepare for transition to Phase 2 ACN and tanker relay platforms logy to improve performance of commercial ATM over tactical media via	ntenna devel search and to ier (PA) der mitigation I nunications ) On Board on se 2 ACN au	lopments est for a com velopment hardware/sof (SATCOM) Switch (OB; tion to Phase ad tanker rela M over tactii	munication flware and d capability S) technolog ay platforms ay platforms cal media vi	s UAV leployable cc sy for tanker tanker relay it anker relay	ortable radio wideband/multi-band antenna developments agnetic interference/compatibility research and test for a communications UAV rable radio wideband Power Amplifier (PA) development ced development Project 2335 error mitigation hardware/software and deployable communications managem oility at Langley AFB, VA ced, wideband suitcase satellite communications (SATCOM) capability demonstrate the (Proj 4519/DARPA) On Board Switch (OBS) technology for tanker relay and Phase 2 ACN demonstrate the (Proj 4519/DARPA) On Board Switch (OBS) technology for tanker relay platforms applacement issues for ACN platform PA and prepare for transition to Phase 2 ACN and tanker relay platforms logy to improve performance of commercial ATM over tactical media via error correction and channel	ns management hase 2 ACN
ď	Project 642317			Page	Page 7 of 20 Pages	S			Ğ	chibit R-2A (	Exhibit R-2A (PE 0603617F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	GET ITEN	I JUSTIFI	CATION	SHEET (	3-2A Ext	nibit)	ā	DATE February 2000	y 2000
800 <b>04</b>	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>	alidation			PE NUMBER AND TITLE 0603617F Comr Applications	AND TITLE  Comma ons	nd Control	and Com	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	РРОЈЕСТ <b>642317</b>
( <u>n</u> )	A. Mission Description Continued	inued								
9	FY 2000 (\$ in Thousands) Continued	ids) Continued	Ş							
999	\$346 Conduc \$574 Integrat \$3,075 Total	Industry Common Section of Sultcase SATCOM and assess sultability for airborne platforms. Conduct field demonstration of sultcase SATCOM and assess sultability for airborne platforms. Integrate software programmable radios with OBS capability into tanker relay demonstration. Total	es ition of suitcas ammable radio	e SATCOM an s with OBS ca <sub>l</sub>	ıd assess suitab pability into taı	ility for airboi ıker relay den	ne platforms 10nstration			
99999	FY 2001 (\$ in Thousands) \$1,200 Airborn \$1,020 Air For \$877 Air For \$3,097 Total	ids) Airborne Comm Relay (ACR) Air Force Enterprise Management (AFEM) Air Force Enterprise Defense (AFED) Total	ACR) nagement (AF. fense (AFED)	ЕМ)						
9	<b>B. Project Change Summary</b> Project has been restructured to address the focus areas identified by AC2ISRC, specifically 'Enabling the Global Grid'. Three project p this: Airborne Communications Relay (ACR), AF Comprehensive Enterprise Management(ACEM) and AF Enterprise Defense (AFED)	o address the foc s Relay (ACR),	us areas identif AF Comprehen	ied by AC2ISI sive Enterprise	RC, specificall Management	y 'Enabling th ACEM) and 1	e Global Grid'. AF Enterprise I	Three projec Jefense (AFEI	identified by AC2ISRC, specifically 'Enabling the Global Grid'. Three project programs were created to address prehensive Enterprise Management(ACEM) and AF Enterprise Defense (AFED).	reated to address
3	C. Other Program Funding Summary (\$ in Thousands)	ummary (S in T	Thousands)							
		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	EY 2005 Estimate	Cost to Complete	Total Cost
9	RDT&E, AF (0602702F, Project 4519)	17,055	10,817	13,208	13,300	13,990	14,577	16,026	Continuing	TBD
<u>(</u>	RDT&E, AF (0603789F, Project 2335)	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Continuing	TBD
<u>(C</u>	RDT&E, AF (0603789F, Project 4216)	2,316	2,458	2,640	2,687	2,752	2,809	2,868	Continuing	TBD
u.	Project 642317			Page	Page 8 of 20 Pages				Exhibit R-2A (PE 0603617F)	E 0603617F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 2000	2000
BUE <b>04</b>	вирсет Астіміту 04 - Demonstration and Validation	PENUMBER AND TITLE 0603617F Command Control and Communication Applications	munication	РRОЈЕСТ <b>642317</b>
<u> </u>	<b>D. Acquisition Strategy</b> The Information Grid Division of the Air Force Research Laboratory's Information Directorate manages the acquisition of technology to be integrated via ESC's Global Grid and Defensive Information Warfare PAD's into acquisition programs such as Theater Deployable Communications (TDC) and the CITS/BITS programs. All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) as appropriate for advanced development efforts. All contracts use Evolutionary Prototyping, with heavy user participation.	ation Directorate manages the acquisition of technology ch as Theater Deployable Communications (TDC) and th (CPFF) and Cost Plus Award Fee (CPAF) as appropriation.	to be integrated via I ne CITS/BITS progra	ESC's Global ams. All opment
9	E. Schedule Profile	FY 1999 FY 2000	FY 2001	00 <u>1</u>
<u> </u>	C2 Link  -JEFX 99 Demonstration Deployable Asyn Transfer Mechanism (ATM)  - Global Patriot & Ft Gordon exercises  -Proto HDWR installed Reachback Facility Airborne Comm Relay (ACR)  - Phase I/II Demo  - Multi-Band Antenna Design  - Wideband Power Amplifier Design  - Wideband Free Monto (AEEM)  - Wassen III EFX Demo  - Wassion 1.0 prototype demo  - Expand to 4 ACC sites  - Integrate adv Defense Info Warfare s/w  Info For Global Research (IFGR)  - Initiate AMC/TACC integration	* * * *	×	* ** * *
	Project 642317	Page 9 of 20 Pages	Exhibit R-2A (PE 0603617F)	0603617F)

	RDT&E PROGRAM ELEMENT	SRAM ELE		/PROJECT C	OST BF	COST BREAKDOWN (R-3)	WN (R-3)		DATE Fe	February 2000	000
<b>9</b>	вирсет аститу 04 - Demonstration and Validation	Validation			PE NUMBER AND T 0603617F Cc Applications	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	and Contr	ol and Co	mmunica	ation	РРОЈЕСТ <b>642317</b>
<u>(</u>	A. Project Cost Breakdown (\$ in Thousands)	n (\$ in Thousan	<del>(Sp</del>				0001 AH	000	) OC 20	۶	EV 2001
9		ware integration					2,8	2,838	2,592	<b>3</b>	2,610
999	<ul><li>(U) Government Engineering Support</li><li>(U) Contractor Engineering Support Total</li></ul>	s Support Support			·		1 3,6	184 25 3,047	192 291 3,075	1. 5.	196 291 3,097
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ory and Plannin	g Informatio	<u>ın (\$ in Thousand</u>	<u> </u>						
3	Performing Organizations:										
	Contractor or		•								
	<u>Government</u> Performing	Method/1ype or Funding	Award or Obligation	Pertorming Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Product Development Organizations	<u>izations</u>									
	GE Marconi		Sept 98	1,661	1,661	210	797	646	0	0	1,653
	BBN		Sept 96	1,370	1,370		217	545	593	0	1,355
	USAF C2BL	PD				0	147	0	0	0	147
	Various	TBD	TBD	TBD	TBD	0	1,382	1,369	1,982	Continuing	TBD
	Support and Management Organizations	ganizations									7. 1
	AF Research Lab	In-house	N/A	N/A	A/N F	12,153	207	220	228	Continuing	TBD
	MILKE Test and Evaluation Organizations	ations	Y/N	¥/N	1BD		167	C67	<del>1</del> 67	Commung	IBD
	Not Applicable										
9	Government Furnished Property:	operty: Contract									
	,	Method/Type	Award or	:			•	,	•		
	<u>Item</u> Descrintion	or Funding Vehicle	Obligation Date	Delivery Date		Total Prior	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to	Total Program
			A								To State
	Project 642317			Page	Page 10 of 20 Pages	ges			Exhib	Exhibit R-3 (PE 0603617F)	603617F)

RDT&E PROGRAM ELEMENT/PROJECT	/PROJECT COST BREAKDOWN (R-3)	WN (R-3)		DATE Fe	February 2000	9
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control and Communication Applications	and Contr	ol and Co	mmunica		PROJECT <b>642317</b>
(U) Government Furnished Property Continued:  Contract Method/Type Award or Obligation Vehicle Product Development Property Not Applicable Support and Management Property Test and Evaluation Property Subsocial	Total Prior to FY 1999  Total Prior	Budget FY 1999 Budget	Budget FY 2000 Budget	Budget FY 2001 Budget	Budget to Complete Budget to	Total Program Total
Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation	210	2,543	2,560	2,575 522	TBD	TBD
Total Project	12,363	3,047	3,075	3,097	TBD	OBT
Project 642317	Page 11 of 20 Pages			Exhibi	Exhibit R-3 (PE 0603617F)	3617F)

	RDT&E BUDGET ITEM JU		ATION (	STIFICATION SHEET (R-2A Exhibit)	R-2A E	xhibit)		DATE	Februa	February 2000
80DX <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603617F Comr Applications	RAND TITLE  F Comnions	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	ntrol and	Commu	nication	PROJECT <b>642321</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642321	21 Tactical Battle Information Management	4,540	4,029	4,060	4,109	4,177	4,261	4,346	Continuing	TBD
9	A. Mission Description  Designs and integrates improvements to system software and Command Control (C2) applications via spiral development, rapid prototyping and maximum user participation in all design activities. Current focus is the functional development of the Joint Defensive Planner (JDP), designated by the Joint Staff (J6V) Joint Standards Air Operations Software Configuration Control Board as a joint application for use by all the Services. JDP will provide the single theater air and missile defense automated system that aids Joint air defense duty officers and the Area Air Defense Commander (AADC) and staff in planning the integrated employment of Defensive Counter-Air and Active and Passive Defenses in conjunction with Offensive Counter-Air, to destroy or neutralize enemy aircraft and theater missiles. Development is compliant with the Defense Information Infrastructure (DII) Common Operating Environment (COE) for integration into Theater Battle Management Core System (TBMCS) and the Global Command and Control System (GCCS). Future efforts respond to evolving concepts advocated by the Aerospace C2 & Intelligence Surveillance Reconnaissance Center (AC2ISRC). Emphasis is on Distributed Collaborative Dynamic Battle Management of Expeditionary Aerospace Forces (EAF) in areas such as planning, execution management, retasking (mission reflow), effects based operations, campaign assessment, atmospheric and space environmental effects on weapons and surviellance systems, and information warfare in support of Joint, Combined and Coalition Theater Air Opererations.	tware and Co s the function ontrol Board duty officers nses in conju tion Infrastru id Control Sy C2ISRC). En tanagement, 1 systems, and i	mmand Con al developm as a joint ap and the Are nction with ceture (DII) of stem (GCC) uphasis is on etasking (m	are and Command Control (C2) applications via spiral development, rapid prototyping and maximum us the functional development of the Joint Defensive Planner (JDP), designated by the Joint Staff (J6V) Join strol Board as a joint application for use by all the Services. JDP will provide the single theater air and muty officers and the Area Air Defense Commander (AADC) and staff in planning the integrated employntes in conjunction with Offensive Counter-Air, to destroy or neutralize enemy aircraft and theater missile on Infrastructure (DII) Common Operating Environment (COE) for integration into Theater Battle Mana; Control System (GCCS). Future efforts respond to evolving concepts advocated by the Aerospace C2 & 2ISRC). Emphasis is on Distributed Collaborative Dynamic Battle Management of Expeditionary Aerosp nagement, retasking (mission reflow), effects based operations, campaign assessment, atmospheric and systems, and information warfare in support of Joint, Combined and Coalition Theater Air Opererations.	olications vii int Defensiv use by all the Se Commano ounter-Air, the erating Envi orts respond Collaborativ ), effects ba upport of Jo	a spiral develue Planner (Just Parises, Just Parises, Just Parises, Just Parises, Just Parise	lopment, ray DP), design JDP will prc and staff in neutralize e OE) for inte, y concepts at Battle Mana ns, campaig led and Coal	oid prototyp ated by the wide the sir planning th nemy aircra gration into dvocated by igement of F n assessmen lition Theate	ing and maxi Joint Staff (J Joint Staff (J ingle theater a e integrated of ft and theater Theater Batt the Aerospa Expeditionary it, atmospher er Air Operer	mum user 5V) Joint ir and missile employment of r missiles. le Management ce C2 & / Aerospace ic and space ations.
99999	FY 1999 (\$ in Thousands)  \$710	to TBMCS V1.0.1 LEX coordinated 1 Defensive Planner	1.0.1 ited replann inner (JDP)	ing (reflow) as TBMCS I	prototype XII COE cor	npliant segm	nents			
99 9999	<ul> <li>EY 2000 (\$\frac{\$}\$ in Thousands)</li> <li>\$42 Complete initial DII COE FLEX coordinated replanning (reflow) prototype for TBMCS V2.X \$2,602 Continue Joint Defensive Planner (JDP) V2.0 software development \$1,192 Initiate integration activity for coordinated strategy-to-task for offensive (FLEX), Joint Defensive Planner (JDP), and information operations, including atmospheric environment impacts Prototypes for TBMCS V2.X \$193 Adapt Joint Defensive Planning, Air Tasking Order (FLEX) monitor and retasking for Battle Control Center \$4,029 Total</li></ul>	EX coordinal nner (JDP) V r coordinated nment impaci ng, Air Taski	ted replannii 2.0 software strategy-to- is Prototype: ng Order (F	ng (reflow) page developmentask for offers for TBMCS tor TEX) monito	rototype for  It nsive (FLE)  V2.X  r and retask	· TBMCS V2 C), Joint Defe ing for Battl	2.X ensive Plant le Control C	ner (JDP), ar enter	nd informatic	on operations,
Ū.	Project 642321		Page	Page 12 of 20 Pages	ŞŞ			Ä	thibit R-2A (	Exhibit R-2A (PE 0603617F)
				777						

	RDT&E E	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	A JUSTIF	CATION	SHEET (1	R-2A Exh	libit)	Ö,	DATE February 2000	, 2000
90 <b>4</b>	вирсет Астіліту 04 - Demonstration and Validation	d Validation			PE NUMBER AND TITLE 0603617F Comr Applications	AND TITLE  F Commai	nd Control	and Com	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	PROJECT <b>642321</b>
9	A. Mission Description Continued	Continued								
99	EX 2001 (\$ in Thousands) \$1.407 Cor	<u>ds)</u> Complete JDP software development and integration into TBMCS V 2.X	development a	nd integration	into TBMCS V	/2.X				
33	, ,	Adapt JDP TBMCS V2.0 for GCCS-AF Integration Initiate effects based operations for joint aerospace operations	.0 for GCCS-A erations for join	F Integration nt aerospace of	perations					
<u> </u>	\$1,000 Co	Continue integration activity for coordinated strategy-to-task for offensive, defensive and information operations includingatmospheric environment impacts prototypes for TBMCS V2.X	tivity for coord ototypes for TE	inated strategy MCS V2.X	-to-task for off	ensive, defensi	ive and inform	ation operatio	ns includingatmosp	heric
33	\$560 \$4,060	Initiate decision aids for space environment impact effects on coordinated strategy-to-task for joint air operations Total	r space environ	ment impact el	ffects on coord.	inated strategy	-to-task for joi	nt air operatio	su	
3	B. Project Change Summary Not Applicable	mary								
9	C. Other Program Funding Summary (\$\summarrow\$ in Thousands)	ling Summary (\$ in ]	Chousands)							
		FY 1999 Actual	EX 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	EY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to	Total Cost
3	RDT&E, AF (0603789F,	3,907	4,093	2,557	5,087	5,198	5,306	5,416	Continuing	TBD
9	Project 2335) RDT&E, AF (0207438F,	11,972	0	0	0	0	0	0		TBD
<u> </u>		0	23,007	20,439	18,120	17,682	20,433	20,859	Continuing	TBD
	Project 4790)								)	
9	-	the Air Force Researc	h Laboratory's	Information Di	irectorate mana	iges the acquis	ition of techno	logy under the	direct guidance of	fthe AC2ISRC.
	The objective is to integrate into the Theater Battle Management Core System (TBMCS) through a Memorandum of Understanding (MOU) entitled 'Shared management of TBMCS Technology Development' with the TBMCS System Program Office (SPO). As nominated by the Air Staff, some applications are designed for integration into	ate into the Theater B evelopment' with the	attle Managem TBMCS Syste	ent Core Syste m Program Ofi	em (TBMCS) the Fice (SPO).As i	nrough a Meme	orandum of Un the Air Staff, so	nderstanding (I	MOU) entitled 'Shanns are designed for	red management r integration into
	the Air Force Global Command and Control System (GCCS-AF). All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost Plus Award Fee (CPAF) as appropriate for advanced development efforts. All contracts use the Spiral Development Model and Evolutionary Prototyping, with heavy user participation from all the Services, and produce joint software applications, as designated by the JCS Joint Standard Air Operations Software Configuration Control Board.	unand and Control Sy as appropriate for adva the Services, and pro	stem (GCCS-/ anced developr duce joint soft	<ul><li>All contra nent efforts. A ware applicatio</li></ul>	cts are awardec All contracts use ons, as designat	I under full cor e the Spiral De ed by the JCS	npetition and i velopment Mo Joint Standard	nclude Cost P del and Evolu Air Operation	iCCS-AF). All contracts are awarded under full competition and include Cost Plus Fixed Fee (CPFF) and Cost evelopment efforts. All contracts use the Spiral Development Model and Evolutionary Prototyping, with heave int software applications, as designated by the JCS Joint Standard Air Operations Software Configuration Cont	F) and Cost g, with heavy uration Control
	Project 642321			Page	Page 13 of 20 Pages	s			Exhibit R-2A (PE 0603617F)	E 0603617F)

PER NUMBER AND TITLE  G603617F Command Control and Common Common Control and Common Common Control and Common Comm		RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	HEET (R-2A Exhibit)	DATE February 2000	y 2000
E. Schedule Profile  1 2 3 4 1 2 3 4  TBM Systems Integration Evaluation FLEX - TBMCS VI.01 integration Replanning (reflow) prototype demo Joint Defensive Planner software development and integration - Functional Validation Model #1 & 2  - TBMCS VI.01 integration Replanning (reflow) prototype demo Joint Defensive Planner software development and integration - Functional Validation Model #1 & 2  - TBMCS VI.01 integration - TBMCS VI.01 integration - TBMCS VI.01 integration - Functional Validation Model #1 & 2  - TBMCS VI.01 integration - Functional Validation Model #1 & 2  - TBMCS VI.01 integration - TBMCS VI.0	800 <b>04</b>	GET ACTIVITY - Demonstration and Validation	PE NUMBER AND TITLE 0603617F Command Control an Applications	nd Communication	PROJECT <b>642321</b>
TBMC Systems Integration Evaluation  - TBMCS VI.0 integration  - TBMCS VI.0.1 integration  Replanning (reflow) prototype demo  Joint Defensive Planner software development and integration  Replanning (reflow) prototype demo  Joint Defensive Planner software development and integration  - EP #2/3  GCCS Integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS V.x integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration  - Functional Validation Model #1 & 2  - TBMCS VI.0 integration Validation V	<b>(</b> 2)	E. Schedule Profile	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	4	FY 2001
Dama 14 of 20 Dames	555555555555	TBM Systems Integration Evaluation FLEX - TBMCS VI.0 integration - TBMCS VI.0.1 integration - TBMCS VI.0.1 integration Replanning (reflow) prototype demo Joint Defensive Planner software development and integration - EP #2/3 GCCS Integration - Functional Validation Model #1 & 2 - TBMCS V.x. integration Battle Control Center Evaluations. Coordinated Strategy-to-task Spiral 1 Coordinated Strategy-to-task Spiral 1 Coordinated Strategy-to-task Spiral 1 Note: * represents a completed event; X represents a planned event	*	× ××	
1 ago 14 01 20 1 agos	4	Project 642321	Page 14 of 20 Pages	Exhibit R-2A (PE 0603617F)	<sup>э</sup> Е 0603617F)

	RDT&E PROGRAM ELEMENT	RAM ELE		/PROJECT CO	OST BF	COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>F</b> 6	February 2000	000
8UD <b>94</b>	BUDGET ACTIVITY 04 - Demonstration and Validation	/alidation			PE NUMBER AND T 0603617F Cc Applications	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	and Contr	ol and Co	mmunica	ation	РRОЈЕСТ <b>642321</b>
(D)	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	(8)				1 727	000	00 XI	9	1000 133
5	Software Develonment						3.266	3.266	3.046	31 92	2.822
3	Government Engineering Support	port						069	749	6	866
33	Contractor Engineering Support Total	ort					4,	584 4,540	234 4,029	4 6	372
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannin	g Information	(\$ in Thousand	ด						
9	Performing Organizations:										
	Contractor or	Contract	•								
	Government Performing	Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior	Rudget	Rudget	Rudaet	Budget to	Total
	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	EY 2000	EY 2001	Complete	ᅿ
	Product Development Organizations	zations									
	Logicon	C/CPFF	June 94	9,782	9,782	9,114	912	45		0	10,071
	PRB Assoc.	C/CPAF	Feb 97	7,435	7,435	1,496	2,500	2,324	1,015	380	7,715
	TBD							647	1,754	Continuing	TBD
	Support and Management Organizations	anizations									
	AF Research Lab	In-house	N/A	N/A	TBD	27,423	642	779	921	Continuing	TBD
	Lockheed Martin							115	193	Continuing	TBD
	Litton/IASC Miscellaneous	Various	Varions	A/X	TRD		486	119	//1	Continuing	IBD
	Test and Evaluation Organizations	tions		1							
	Not Applicable										
	Project 642321			Page	Page 15 of 20 Pages	ges		:	Exhib	Exhibit R-3 (PE 0603617F)	)603617F)

RDT&E PROGRAM ELEMENT/PROJECT C	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	
BUDGET ACTIVITY	PE NUMBER AND TITLE	7 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	7000			PROJECT 642234
	Applications		ol alla co	IIIIIIIIIII		17674
Subtotals	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotal Product Development Subtotal Support and Management	10,610 27,423	3,412 1,128	3,016 1,013	2,769 1,291	TBD	TBD
Subtotal Test and Evaluation Total Project	38,033	4,540	4,029	4,060	TBD	TBD
Project 642321	Page 16 of 20 Pages			Exhibil	Exhibit R-3 (PE 0603617F)	3617F)

Perpendicular   Perpendicula		RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	USTIFIC	ATION (	SHEET (	R-2A E	xhibit)		DATE	February 2000	y 2000
A. Mission Description Provides systems integration support to the Acrospace Command Control & Intelligence Surveillance Recommendations, identifies deficiencies, and efforts integration support to the Acrospace Command Control & Intelligence Surveillance Recommendations, identifies deficiencies, and efforts integration and integration support to the Acrospace Command Control & Intelligence Surveillance Recommendations, identifies deficiencies, and earlier and integration and analysis of effects based operations prototype tools for development and interoperability (see BPAC 64221) for technology transition within PE  EV. 2001 (S. In. Thousands)  EV. 2001 (S. In. Thousands)  EV. 2002 EV. 2003 EV. 2004 EV. 2005 E	800 <b>94</b>	оет астічту - Demonstration and Validation			РЕ NUMBE 0603617 Applica	RAND TITLE  F Comn	nand Cor	ıtrol and	Commu	nication	PROJECT <b>643804</b>
A Mission Description Provides systems engineering and integration support to the Acrospace Command Control & Intelligence Surveillance Recommissance Center (ACZISRC) dee efforts. Project addresses integration and interoperability issues associated with ACZISRC directed efforts, makes recommendations, identifies deficiencies, a establishes requirements for development efforts. Project addresses integration and interoperability issues associated with ACZISRC directed efforts, makes recommendations, identifies deficiencies, a establishes requirements for development efforts. Project addresses integration and interoperability issues associated with ACZISRC directed efforts, makes recommendations, identifies deficiencies, a establishes requirements for development efforts. Project addresses integration and interoperability (See BPAC 64321) for technology transition within PE 5203 Total  EV 2000 (S in Thousands)  EV 2001 (S in Thousands)  EV 200		COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
A Mission Description Provides systems engineering and integration support to the Aerospace Command Control & Intelligence Surveillance Reconnaissance Center (ACZISRC) deferdes systems engineering and interoperability issues associated with ACZISRC directed efforts, makes recommendations, identifies deficiencies, a catalogistic integration and interoperability issues associated with ACZISRC directed efforts, makes recommendations, identifies deficiencies, a catalogistic requirements for development efforts.  EV 1999 (S. in Thousands) S103 Analyzed Commander's Planning and Execution Tool (CPET) Prototype Candidate for technology transition within PE EV 2000 (S. in Thousands) S219 Initiates detailed analysis of stategy-to-task Prototype tools for development and interoperability (See BPAC 64321) for technology transition within PE EV 2001 (S. in Thousands) S223 Initiates detailed analysis of effects based operations prototype tools for development and interoperability (See BPAC 642321) for technology transition within PE S223 EV 2004 (S. in Thousands) S223 EV 2004 EV 2002 EV 2002 EV 2003 EV 2003 EV 2004 EV 2003 EV 2004 EV 2004 EV 2004 EV 2004 EV 2004 EV 2005 EV 2006 EV 2006 EV 2006 EV 2006 EV 2006 EV 2007 EV 2006 EV 2007 EV 2006 EV 2007 EV 2007 EV 2007 EV 2006 EV 2007 EV 2006 EV 2007	6438		203			233	239	244	247	Continuing	TBD
FY 1999 (5 in Thousands)  \$103	9		ort to the Aer ability issues	rospace Com	mand Contre	ol & Intellige	ence Surveill forts, makes	lance Recon recommen	maissance C dations, iden	enter (AC2IS)	RC) development ncies, and
EY 2000 (\$ in Thousands) \$219	5555	999 (\$ in Thousar	ve Planner ad nning and Ex	lvanced techn ecution Tool	ology demor (CPET) Prot	ıstration pro otype Candi	totype date for tech	nology tran	sition withir	ı PE	
FY 2001 (\$ in Thousands) \$223 Initiates detailed analysis of effects based operations prototype tools for deveopment and interoperability (see BPAC 642321) for technotary in the second part of the second	<u> </u>	EY 2000 (\$ in Thousar \$219 \$219	`stategy-to-ta	sk Prototype	tools for dev	elopment an	id interopera	bility (See F	3PAC 64321	l) for technolc	ogy transition
B. Project Change Summary  None  C. Other Program Funding Summary (\$\sin \text{Thousands}\$)  EY 2001 FY 2002 FY 2004 FY 2005 Cost to  Actual Estimate Estimate Estimate Estimate Complete  Not Applicable  Page 17 of 20 Pages  Exhibit R-2A (PE 060	<u> </u>	FY 2001 (\$ in Thousar \$223 \$223	effects based	1 operations p	rototype too	ls for deveop	oment and in	teroperabili	ty (see BPA	C 642321) fo	r technology
C. Other Program Funding Summary (\$ in Thousands)  EY 1999 FY 2000 FY 2001 FY 2002 FY 2004 FY 2005 Cost to Actual Estimate Estimate Estimate Estimate Complete  Not Applicable  Page 17 of 20 Pages	9										
Page 17 of 20 Pages	9	C. Other Program Funding Summary (\$ in Tho FY 1999 J	v 2000 X 2000	FY 2001 Estimate	FY 2002 Estimate	FY 2003		,	<u>2005</u>	Cost to	Total Cost
Page 17 of 20 Pages	5_	Trund Trund	Ammar	Anning	Louman	Forming.			A THIBIT	Avaiding	
		Project 643804		Page	17 of 20 Pag	es			Ú	chibit R-2A (I	PE 0603617F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (R-2A Exhibit)	DATE February 2000	2000
<b>9</b> 4	вирсет Астіvіту 04 - Demonstration and Validation	PENUMBER AND TITLE 0603617F Command Control and Communication Applications	mmunication	PROJECT <b>643804</b>
(E)	D. Acquisition Strategy Not Applicable			
<u> </u>	E. Schedule Profile	FY 1999 FY 2000	FY 2001	<u>100</u>
5555	Evaluate Commander""s Planning Execution Tool design Evaluate JDP prototype(s) Evaluate Strategy-To-Task prototypes Evaluate effects based ops prototypes Note: * represents a completed event; X represents a planned event.	2 * * 1 5 * * 2 * 3 * 4 1 5 3 * 4 1 5 3 * 4 1 5 3 * 5 * 5 * 5 * 5 * 5 * 5 * 5 * 5 * 5	4 × 2	£ ★
О.	Project 643804 Page 1	Page 18 of 20 Pages	Exhibit R-2A (PE 0603617F)	0603617F)

	RDT&E PROGRAM ELEMENT	SAM ELE	MENT/F	I/PROJECT COST BREAKDOWN (R-3)	SOST BI	REAKDO	WN (R-3)		DATE Fe	February 2000	000
800 <b>04</b>	виреет астилту 04 - Demonstration and Validation	lidation			PE NUMBER AND 1 0603617F Co Applications	PE NUMBER AND TITLE  0603617F Command Control and Communication Applications	and Contr	rol and Co	mmunica	ıtion	PROJECT <b>643804</b>
<b>(</b> 2)	A. Project Cost Breakdown (\$ in Thousands)	in Thousan	ds)				į				
9	Systems Engineering						FY 1999	666	FY 2000	21	FY 2001
<b>E</b> E	Government Engineering Support Contractor Engineering Support	t 1						103	219	6	223
<u>(E</u>	Total							203	219	6	223
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	and Plannin	g Informati	on (\$ in Thousan	(Sp)						
9	Performing Organizations:										
	Contractor or C	Contract Method/Tyne	Award or	Performing	Project						
	ing	or Funding	Obligation	Activity	Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity Vehicle	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	ISX Corp	Task Order		100	100	0	100				100
	and Management Orga	vizations			í E	•	,				
	MILKE AFDecentry I ok/AC21SBC In	SS/10&F	Various	A/X	TBD Car	2,138	0 ;	0 ;	0 8	Continuing	TBD
		in-nouse Various	N/A Various	N/A N/A	TBD	132	103 0	219 0	223 0	Continuing Continuing	TBD TBD
	Test and Evaluation Organizations	SU								0	!
9	Government Furnished Prop	rty:									
	IS K	Method/Type	Award or								
		or Funding	Obligation	Delivery		Total Prior	Budget	Budget	Budget	Budget to	Total
	Vescupuon Product Development Property Not Amiliakie	Xenicie	Date	Date		to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Not Applicable Support and Management Property Not Applicable	ZŢ.									
ıL	Project 643804			Pag	Page 19 of 20 Pages	ges			Exhibi	Exhibit R-3 (PE 0603617F)	303617F)

	RDT&E PROGRAM ELEMENT/PROJECT CO	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	8
BUDGET ACTIVITY <b>04 - Demons</b> í	tration and Validation	PENUMBER AND TITLE  0603617F Command Control and Communication Applications	and Contro	ol and Co	mmunica		РРОЈЕСТ <b>643804</b>
(U) Gove Test a Not A	Government Furnished Property Continued: Test and Evaluation Property Not Applicable						
<u>Subtotals</u> Subtotal F	Subtotals Subtotal Product Development	Total Prior to FY 1999 0	<u>Budget</u> <u>FY 1999</u> 100	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program 100
Subtc	Subtotal Support and Management Subtotal Test and Evaluation	2,270	103	219	223	TBD	TBD
Total	Total Project	2,270	203	219	223	TBD	TBD
Project	Project 643804 Page 20	Page 20 of 20 Pages			Exhibit	Exhibit R-3 (PE 0603617F)	03617F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	JSTIFIC	ATION	SHEET	(R-2 Ex	hibit)		DATE	February 2000	y 2000
<b>BUDGET ACTIVITY</b>	_			PE NUMBER	PE NUMBER AND TITLE					PROJECT
04 - Demons	04 - Demonstration and Validation			0603690	F Inforn	nation O	0603690F Information Operations Technology	<b>Techno</b>	logy	644856
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644856 Informal	Information Operations Technology	0	0	991	066	686	686	886	988 Continuing	TBD
Quantify	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
									•	,

USAF has initiated action to consolidate funds from this Program Element with those in Program Element 0303140F. This consolidation is expected to be complete for the FY02 President's Budget.

### A. Mission Description

documented by major commands (MAJCOMS), unified commands, and IO agencies in mission area plans and mission need statements. The labs and program office work directly with users and battle labs to set priorities and find synergistic combinations of new technology, doctrine and training. The goal of this program is to Information Operations (IO) Technology demonstrates and validates advanced technology-based capabilities and techniques to support tactical and operational commanders' and National Command Authorities' needs for offensive and defensive IO. The projects are oriented towards specific shortfalls and deficiencies expedite technology transition from the laboratory and industry to operational use via rapid prototyping. The Integrated Information Operations project will investigate and develop techniques and technologies for integrated IO. It will include a series of studies designed to assess cross-functional opportunities and capabilities to address various aspects of Integrated IO. Potential focus areas include integrated attack opportunities, defense oportunities, and integration of IO planning into air operations planning. Projects efforts will be prioritized and guided by the IO Technical planning Integrated Planning Team (TPIPT) in support of the Air Force Counterinformation Mission Area Plan and the DOD IO Master Plan.

The initial study is investigating techniques and technologies for defending systems against sophisticated Information Warfare (IW) and computer network attacks that are beyond commercially available protection systems. Specific content is classified, and is available in the Panther Den (PD) Special Access Program (SAP) Report. Later studies will investigate advanced information operations applications of emerging physics capabilities, communications capabilities, and intelligence applications to IO. Examples include exploiting emerging capabilities in directed energy, electronic sensors, and employing emerging capabilities to adversely effect information processing systems using non-kinetic weapons. Specific content is classified, and is available in the Panther Den SAP Report.

security support to the programs funded by this PE, as well as PD-classified projects funded via other PEs. Details of the other PD-classified projects are contained in This program also funds the Panther Den program office at Hanscom AFB, MA. The Panther Den program office provides technical, program management, and the Panther Den SAP report.

Project 644856

Page 1 of 4 Pages

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2 Exhibit		DATE February 2000	2000
BUD( <b>04</b> -	вирсет астилту <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603690F Information Operations Technology	Operations Te	chnology	PROJECT <b>644856</b>
<u>(5</u>	A. Mission Description Continued				
999	FY 1999 (\$ in Thousands) \$0 No Activity \$0 Total				
999	FY 2000 (\$ in Thousands) \$0 No Activity \$0 Total				
233333	\$350 Directed Energy Application to IW \$75 Advanced IO Communication Application \$66 Advanced Intelligence Applications to IO Mitre Chief Engineer Support \$200 Program Office and Security Structure Support Total				
<b>5</b>	B. Budget Activity Justification This program is in Budget Activity 4 - Demonstration and Validation, because it demonstrates and validates advanced technology which enhances IO systems, capabilities and techniques.	se it demonstrates and validates a	ivanced technology v	which enhances IO syst	ems,
9	C. Program Change Summary (\$ in Thousands)	FY 1999	FY 2000	FY 2001	Total Cost
555	Appropriated Value Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions f. Other	0	491	491	TBD
Д	Project 644856	Page 2 of 4 Pages		Exhibit R-2 (PE 0603690F)	0603690F)
		227			

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (	R-2 Exhi	bit)	Ö	DATE February 2000	2000
BUDG <b>04 -</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603690F Inform	AND TITLE Informat	PE NUMBER AND TITLE 0603690F Information Operations Technology	tions Tech	ypolody	РRОЈЕСТ <b>644856</b>
(n)	C. Program Change Summary (\$ in Thousands) Continued		FV 1999	FY 2000		FY 2001	Total Cost
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR			0		500 991	TBD
<u>(C</u>	Significant Program Changes: Information Warfare Support, to support information operations development in this program element.	pport, to suppo	rt information	ı operations de	velopment in 1	this program elemen	
Ð	D. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000  Actual Estimate Estimate	FY 2002 Estimate	FY 2003 Estimate	FX 2004 Estimate	FY 2005 Estimate	Cost to	Total Cost
<u>99</u>							
	PE 0603690F studies will leverage current DOD lab efforts. Studies will be deconflicted with and will complement Computer Security RDT&E and Information Warfare development efforts under PE 0303140F, Information Systems Security Program, and PE 0208021F, Information Warfare Support.	deconflicted writy Program, a	th and will co	mplement Con	nputer Securit on Warfare Su	y RDT&E and Inforn pport.	mation
	Some aspects of this program will be protected under the PANTHER DEN Special Access Program. Data available upon request.	pecial Access l	rogram. Data	ı available upo	n request.		
<b>E</b>	E. Acquisition Strategy All major contracts within this Program Element are awarded after full and open competition unless other than full and open is justified to the Designated Acquisition Commander (DAC).	pen competitio	n unless other	than full and o	pen is justifie	d to the Designated	Acquisition
Ē	E. Schedule Profile	FY 1999 2 3	4	$\frac{\text{FY } 2000}{1}$	.000 3 4	FY 2001	3 4
5555	Sophisticated IW Defense Study Start Directed Energy Application to IW Advanced IO Communication Application Advanced Intelligence Applications to IO X - Denotes planned event * - Denotes completed event			×		×	
	Project 644856	Page 3 of 4 Pages				Exhibit R-2 (PE 0603690F)	0603690F)

	RDT&E PROGRAM ELEMENT	RAM ELE		I/PROJECT COST BREAKDOWN (R-3)	OST BI	<b>SEAKDOV</b>	VN (R-3)		DATE <b>Fe</b>	February 2000	00
BUD( <b>04</b>	вирсет астіліту 04 - Demonstration and Validation	alidation			PE NUMB <b>06036</b> 9	PE NUMBER AND TITLE 0603690F Information Operations Technology	ation Ope	rations Te	chnology		РРОЈЕСТ <b>644856</b>
(a)	A. Project Cost Breakdown (\$ in Thousands)	S in Thousan	ds)				FY 1999	666	FY 2000	Q	FY 2001
9	Directed Energy Application to IW	o IW					1	10		<b>1</b> 0	350
<u> </u>	Advanced IO Communication Application Advanced Intelligence Applications to IO Mitre Chief Engineer Support Program Office and Security Support Total	Application ations to IO support						0	J	0	75 66 300 200 991
<u>e</u>	B. Budget Acquisition History and Planning Information (\$ in Thousands)	y and Plannii	ng Information	(S in Thousand	ଜ						
3	Performing Organizations:										
	Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	Product Development Organizations Contractor TBD	ations						0	350	Continuing	TBD
	Contractor TBD								99	Continuing	TBD
	Support and Management Organizations Electronic Systems Center	anizations							80		08
	Aegis, Inc (Security								120		120
	Mitre (Engineering Support)								300		300
	Test and Evaluation Organizations	ions				Total Prior	Budget	Budget	Budget	Budget to	Total
	Subtotals Subtotal Product Development Subtotal Support and Management	t nent				to FY 1999	FY 1999	FY 2000 0	FY 2001 491 500	Complete	Program TBD 500
	Subtotal Test and Evaluation Total Project							0	991	TBD	TBD
u.	Project 644856			Pag	Page 4 of 4 Pages	ges			Exhib	Exhibit R-3 (PE 0603690F)	03690F)

	RDT&E BUDGET ITEM JU	JSTIFIC	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	February 2000	y 2000
BUDGET ACTIVITY 04 - Demons	вирсет астипт 04 - Demonstration and Validation			РЕ NUMBER <b>0603742</b>	PE NUMBER AND TITLE 0603742F Comb	at Identi	PE NUMBER AND TITLE 0603742F Combat Identification Technology	echnolo	gy	PROJECT <b>642597</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642597	Noncooperative Identification Subsystems	5,109	7,334	10,933	11,495	12,488	17,039	20,045	20,045 Continuing	
	Quantity of RDT&E Articles	0	-	3	4	0	0	0	0	0
* (1000;6	* O'									

\* Classified information can be provided upon request.

### (U) A. Mission Description

Combat Identification (CID) reduces fratricide, improves combat effectiveness, and enables the battlefield commander to effectively manage and control the battle. (U) U.S. Combat Air Forces have a critical requirement to positively identify enemy, friendly, and neutral aircraft and battlefield equipment. Timely and reliable Such consequences have fostered the following operational requirements for CID systems:

- High confidence of ID
- · High probability of ID (friend, foe, and neutral)
- All weather capable
- · Day/night capable
- · Worldwide operations capable

Enhanced Recognition and Sensing Laser Radar (ERASER) program which is transitioning from PE 0603203F. A spiral development of the ERASER technology into Recognition technique code named HAVE CENTAUR. Project 2597 also develops and demonstrates the most promising air-to-ground combat techniques such as the The Combat ID Technologies program element develops, demonstrates, and transitions promising target identification technologies to meet the requirements cited above. The Combat ID Technologies program element also conducts studies and analyses to quantify combat identification requirements and to identify optimal Expeditionary Air Force Theater Battle Management System. Project 2597 funds the High Range Resolution (HRR) radar program; a Non-Cooperative Target architecture and technologies for the fusion of target identification data into the Single Integrated Air and Ground Pictures and into systems such as the Joint the Advanced Targeting Pod is being conducted under the Laser Vision Program within Project 2597.

# U) FY 1999 (\$ in Thousands)

9	\$2,085	Conducted HAVE CENTAUR algorithm validation, continue synthetic target database development, provide test support and initiate avionics
		architectural analysis for incorporation of HRR capability into follow-on platform.
9	\$1,499	Continued development and demonstration of promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide
		and enhanced mission performance including ERASER program transitioning from PE 63203F.

Project 642597

Exhibit R-2 (PE 0603742F)

Page 1 of 8 Pages

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	PATE PATE February 2000
BUDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation		PENUMBER AND TITLE  0603742F Combat Identification Technology 642597
(D)	A. Mission Description Continued	tion Continued	
99	EY 1999 (\$ in Thousands) Continued \$461 Air-to-Ground	Sands) Continued Air-to-Ground (A/G) CID study. Analyze selected systems to determ	ds) Continued Air-to-Ground (A/G) CID study. Analyze selected systems to determine mission effectiveness, optimal system CID requirements and optimal
99	\$450 \$614	ANG CLD system architecture.  Funded AIMS Program Office support of next generation IFF equipn CID Integrated Management Team and engineering support for integ analysis to increase warfighter's CID canabilities.	s support of next generation IFF equipment integration with current IFF capabilities.  Ream and engineering support for integration and management of Air Force CID programs, conducting related is CID capabilities.
9	\$5,109	Total	
99	FY 2000 (\$ in Thousands) \$1,080 Cor	<ul> <li>Sands)</li> <li>Conduct HAVE CENTAUR algorithm validation, continue synthetic target database development, initiate transition of the synthetic target database to Air Force Information Warfare Center (AFIWC) and National Air Intelligence Center (NAIC) in preparation for fielding of the</li> </ul>	ids) Conduct HAVE CENTAUR algorithm validation, continue synthetic target database development, initiate transition of the synthetic target database to Air Force Information Warfare Center (AFIWC) and National Air Intelligence Center (NAIC) in preparation for fielding of the HRR
<b>(2)</b>	\$5,130	capability and provide test support.  Continue development and demonstration of promising air-to-ground enhanced mission performance, including ERASER program. Begin imaging (ERASER) technology on an operational fighter targeting po	capability and provide test support.  Continue development and demonstration of promising air-to-ground and air-to-air identification techniques for reduced battlefield fratricide and enhanced mission performance, including ERASER program. Begin implementation of Laser Vision Phase I to demonstrate 2-D eyesafe laser imaging (ERASER) technology on an operational fighter targeting pod. The Laser Vision Phase I is a continuation of the development of the
9	\$360	Funds AIMS Program Office support of next generation IFF equipment integration with current IFF capabilities.	tt integration with current IFF capabilities.
<u> </u>	\$764	CID Integrated Management Team and engineering support for integrees/demos to increase warfighter's CID capabilities.	CID Integrated Management Team and engineering support for integration and management of Air Force CID programs, conducting related studies/demos to increase warfighter's CID capabilities.
9	\$7,334	Total	
55	FY 2001 (\$ in Thousands) \$3,170 Cor	ntinue HRR synthetic target	database development, continue transition of the HRR synthetic target database to AFIWC and NAIC and provide
5	\$1,000	test support.  Continue development and demonstration of other promising air-to-ground and air-to-air identification techniques for reduced battlefield	ound and air-to-air identification techniques for reduced battlefield
5	\$5,640	Continue Laser Vision Phase I to demonstrate 2-D eyesafe laser imaging (ERASER) technology on an operational fighter targeting phase II of Laser Vision Phase I to conduct tactics techniques and procedures development with ERASER common targeting nods.	Continue Laser Vision Phase I to demonstrate 2-D eyesafe laser imaging (ERASER) technology on an operational fighter targeting pod. Initiate by a 1 of 1 ager Vision Project to conduct tactics techniques and procedures development with FRASER equipmed targeting pods.
93	\$380 \$743	Funds AIMS Program Office support of next generation IFF equipm CID Integrated Management Team and engineering support for integrated was a constant of the contract of the co	support of next generation IFF equipment integration with current IFF capabilities.  The capabilities is support for integration and management of Air Force CID programs, conducting related
<u>C</u>	Project 642597	Page 2 of 8 Pages	Exhibit R-2 (PE 0603742F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	ON SHEET (	R-2 Exhi	bit)	'Q	DATE February 2000	, 2000
8UD <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603742F Comb	AND TITLE  Combat	PE NUMBER AND TITLE <b>0603742F Combat Identification Technology</b>	ion Techn	ology	PROJECT <b>642597</b>
<u>(c)</u>	A. Mission Description Continued				i		
<u>(</u>	FY 2001 (\$ in Thousands) Continued studies/demos to increase warfighter's CID capabilities.	lities.					
9	\$10,933 Total						
9	<b>B. Budget Activity Justification</b> This program is in Budget Activity 4 - The PE includes advanced technol	logy demonstration	ns that help tra	nsition technol	ogies from la	advanced technology demonstrations that help transition technologies from laboratory to operational use.	onal use.
9	C. Program Change Summary (\$ in Thousands)			j			
į			FY 1999	EY 2000	<b>a</b>	EY 2001	Total Cost
<u> </u>	Previous President's Budget (FY 2000 PBR) Appropriated Value		6,138 6,177	7,393		8,529	
3	Adjustments to Appropriated Value		•	•			
,	a. Congressional/General Reductions		-19				
	<ul> <li>b. Small Business Innovative Research</li> </ul>		-198				
	c. Omnibus or Other Above Threshold Reprogram			-59			
	d. Below Threshold Reprogram		-822				
	e. Rescissions		-29				
5	i. Outlet Adjustments to Budget Years Since FY 2000 PBR					2,404	
3	Current Budget Submit/FY 2001 PBR		5,109	7,334	-	10,933	
<u>5</u>	Significant Program Changes:  Begin implementation of Laser Vision Program in FY00 as spiral development of ERASER technology to demonstrate technology maturity for the Advanced Targeting Pod and Joint Strike Fighter, this initiative is a continuation of the enhanced development for the ERASER program. The Air Force added funds in FY01 for HAVE CENTAUR target database development and transition.	opment of ERASE ced development f	R technology to the ERASE	o demonstrate R program. Tł	technology m ne Air Force a	naturity for the Adv	anced Targeting
E	<u> </u>						
9		FY 2002 Fertimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Fertimate	Cost to	Total Cost
9	0		0	0	0	0	0
		, ,				( ( : : 1	
_	Project 642597	Page 3 of 8 Pages				Exhibit R-2 (PE 0603/42F)	E 0603742F)

RDT&E BUDGET ITEM	引	STIFICATION SHEET (R-2 Exhibit)	i)	DATE February 2000	ry 2000
BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603742F Combat Identification Technology	tification Techr	Ygolot	PROJECT <b>642597</b>
(U) E. Acquisition Strategy  The HAVE CENTAUR program development was awarded under a competitive bid process. Other combat identification efforts in project 2597 also focus on developing and demonstrating the most promising Air-to-Ground Combat ID techniques and will also be contracted for under a competitive Request For Proposal (RFP) process.	nent was awarded under a competiti omising Air-to-Ground Combat ID t	ve bid process. Other combat iden echniques and will also be contrac	tification efforts in pi ted for under a compe	roject 2597 also fo etitive Request Fo	ocus on r Proposal (RFP)
(U) E. Schedule Profile	-	FY 1999 2 3 4 1	EY 2000	1 E	FY 2001
<ul> <li>(U) HRR Platform Suite Efforts Radar Enhancement Test Completion (U) DT&amp;E Completion (U) OTR&amp;E Completion (U) Airbome Data Collection Complete (U) Airbome Data Collection Complete (U) Software Design Review (U) OFP Prel. Design Review (U) OFP Prel. Design Review (U) Systems Requirements Review (U) Systems Requirements Review (U) Systems Requirements Review (U) Flight Demo of 1.66 micron System (U) Hight Demo of 1.57 Micron System (U) A. (U) LASER VISION (U) Phase I RFP Release (U) System Integration &amp; Ground Tests (U) System Integration &amp; Ground Tests (U) Phase II Contract Award (U) Phase II Contract Award</li> </ul>	* * * *	* * * * * *		* *	
Project 642597	Page	Page 4 of 8 Pages		Exhibit R-2 (	Exhibit R-2 (PE 0603742F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2 Exhibit)	DATE <b>Febr</b> i	February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 16603742F Combat Identification Technology	tion Technology	PROJECT <b>642597</b>
(U) E. Schedule Profile Continued	EX 1999 EY 2000	2000	EY 2001
* denotes completed events X denotes planned events	4		
Project 642597	Page 5 of 8 Pages	Exhibit R	Exhibit R-2 (PE 0603742F)

	RDT&E PROGRAM ELEMEN		JECT CC	ST BR	(PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE FA	February 2000	٤
ä	BIDGET ACTIVITY			PE NI IMBE	PE NI IMBER AND TITLE			-	y kal	DBO IECT
8	04 - Demonstration and Validation			0603742F	2F Comba	t Identific	Combat Identification Technology	nology	9	642597
3	A. Project Cost Breakdown (\$ in Thousands)	(spi				1 20	000	00C X3		EX 2001
1						FY 1999		0 0 0	<b>.</b>	FX 2001
€ (	Alfalysis/Modelling and Silliniarion, Suddes, Flans and Rept.  Data Synthesis Algorithm Development Database Sumort	Flans and Reports				, <u>-</u>	979	1 080		2 170
96		nacase support				, o	006	5.030		3,170 4.740
3	_	Operations				. •	864	924		923
9	_						5	100		1,900
<u> </u>	JCIDO Support Reductions to fund other AF or DoD requirements Total	ments				5,1	0 486 5,109	200 0 7,334	<del>-</del> -	200 0 10,933
9	B. Budget Acquisition History and Planning Inform	ng Information (\$ i	ation (\$ in Thousands)	•						
9	Performing Organizations:									
,	Contractor or									
	₽,	Award or	Performing	Project		•		,		ı
	Performing or Funding	Obligation Date	Activity	Office	Total Prior	Budget EV 1000	Budget	Budget EV 2001	Budget to	Total P. October
	on to fund other AF or	Anna	<u> </u>			486	7777	1 400	<u>अञ्चलीमात्रञ</u>	486
	DoD requirements									
	Product Development Organizations									
	Raytheon Co, El Segundo CA CPFF	Sep 92	39,600	39,600	39,600	0	0	0	0	39,600
	Raytheon Co, El Segundo CA CPFF	Nov 98	12,625	12,625	0	700	200	200	Continuing	TBD
	ę.	Aug 93	1,780	1,780	1,780	0	0	0	0	1,780
	McDonnell Douglas AF616	Aug 94	3,550	3,550	3,550	0	0	0	0	3,550
	Veridian (Veda), Dayton, OH CPFF	Aug 94	12,221	12,221	12,221	0	0	0	0	12,221
	Ю	Aug 98	13,000	13,000	0	877	009	2,020	Continuing	TBD
	Simulation Support, Inc. CP	May 99	330	330	0	330	0	0	0	330
	National Air Intel Center AF616	Annually	3,329	3,329	3,329	0	0	0	0	3,329
		Aug 93	2,270	2,270	1,956	210	0	0	0	2,166
		Jan 01	TBD	TBD	0	0	0	0	Continuing	TBD
	ERASER-Raytheon, Plano CPFF	Dec 97	5,532	5,532	<b>-</b>	200	1,170	1,000	Continuing	TBD
	Project 642597		Page	Page 6 of 8 Pages	SS			Exhibi	Exhibit R-3 (PE 0603742F)	33742F)

	RDT&E PROGRAM ELEMENT	3RAM ELE		JECT C	/PROJECT COST BREAKDOWN (R-3)	AKDOW	'N (R-3)		DATE <b>F</b>	February 2000	8
<u>8</u>	BUDGET ACTIVITY  04 - Demonstration and Validation	Validation			PE NUMBER AND TITLE	AND TITLE	Identifica	ID TITLE Combat Identification Technology	) Abolou	4	PROJECT 642507
	- Dellionstration and	Validation			10000172			1011 1001	ÁROIOIII		15034
3		Continued:									
	Floduct Development Organizations TX	STORES									
	Combat Identification	OTA	Jan 00	TBD	TBD	0	0	3,860	2,040	Continuing	TBD
	Integrated Management Team, ESC/SRC, Hanscom AFR MA										
	Patuxent River Naval Res	MIPR	Feb 99/Apr	200	200	0	200	0	0	0	200
	Ft Monmouth, SADL-JTIDS MIPR	; MIPR	7.5 Mar 99	308	308	0	308	0	0	0	308
	Gateway										
	Demeco, Inc	CPFF	Aug 94	9,004	9,004	6,604		0	0	0	6,604
	SAIC (Demaco, Inc)	CPFF	May 99	2,210	2,210	0	300	220	890	Continuing	TBD
	Cyberdynamics	CPFF	May 99	2,112	2,112	0	99	0	0	Continuing	TBD
	AIMS Program Office	MIPR	Annual	TBD	TBD		250	360	380	Continuing	TBD
	Wright Laboratory (Laser	MIPR	Jan 01	TBD	TBD	0	0	0	2,000	Continuing	TBD
	Vision Analysis & ATR										
	development)										
	Support and Management Organizations	rganizations									
	Georgia Tech Res Inst.	CPFF	Aug 94	1,978	1,978	1,978	0	0	0	0	1,978
	USAF Combat ID IMT and	Various	A/A	TBD	TRD		614	764	743	Continuing	TRD
	Engineering Support		! !		   		:			0	
	Wright Laboratory (HRR)	MIPR	N/A	4,000	4,000	2,332	63	09	09	Continuing	TBD
	Test and Evaluation Organizations	ations								•	
	3246th Test Wing, Eglin	Mixed, CPF,	N/A	3,769	3,769	2,319	0	0	0	Continuing	TBD
	AFB, FL 544th Range										
	Group, Nellis AFB, NV										
	412 Test Wing, Edwards AFBMIPR	BMIPR	N/A	1,605	1,605	0	S	100	1,600	0	1,705
	Project 642597			Pag	Page 7 of 8 Pages				Exhib	Exhibit R-3 (PE 0603742F)	03742F)

RDT&E PROGRAM ELEMENT/PROJECT C	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	s e
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 10603742F Combat Identification Technology	t Identific	ation Tec	hnology	a <b>9</b>	PROJECT <b>642597</b>
	Total Prior	Budget	Budget	Budget	Budget to	Total
Subtotals	to FY 1999	FY 1999 486	FY 2000	FY 2001	Complete	Program
Subtotal Product Development	69,041	3,941	6,410	8,530	TBD	TBD
Subtotal Support and Management	4,310	229	824	803	TBD	TBD
Subtotal Test and Evaluation	2,319	5	100	1,600	TBD	TBD
Total Project	75,670	5,109	7,334	10,933	TBD	TBD
Project 642597	Page 8 of 8 Pages			Exhibi	Exhibit R-3 (PE 0603742F)	)3742F)

	RDT	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	(hibit)		DATE	February 2000	۷ 2000
800G <b>04 -</b>	BUDGET ACTIVITY  04 - Demonstration	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603790F NATC	R AND TITLE	ID TITLE NATO Cooperative R&D	ative R&			PROJECT <b>64NATO</b>
	COST (4	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
64NATO	TO Nato Coop R&D		3,956	4,222	5,509	11,685	11,885	12,123	12,363	Continuing	21,257
	Quantity of RDT&E Articles	₹E Articles	0	0	0	0	0	0	0	0	0
<b>(</b> 2)	A. Mission Description These funds will be used to hel allies (Australia, Egypt, Israel, Development (R&D). The proproduction. The legislation autechnologies, eliminating costly interoperability or commonality space, command, control, commonality space, command, commonality space, c	A. Mission Description  These funds will be used to help implement international cooperative research, development, and acquisition (ICRD&A) agreements with NATO and major non-NATO allies (Australia, Egypt, Israel, Japan, and Korea). The program implements the provisions of Title 10 U.S. Code, Section 2350a on NATO Cooperative Research and Development (R&D). The program was established to improve cooperation among NATO nations, and later major non-NATO allies, in research, development, and production. The legislation authorized funds to significantly improve US and allied conventional defense capabilities by leveraging the world's best defense technologies, eliminating costly duplication of research and development efforts, accelerating the availability of defense systems, and promoting US and allied interoperability or commonality. Starting in FY00 these funds will focus on implementing coalition warfare technology and demonstrations that address Air Force space, command, control, communications, intelligence, surveillance, and reconnaissance (C31SR), modernization and readiness needs in support of the National Military Strategy, Joint Vision 2010, and the Air Force's Strategy of Global Engagement. The planned program is shown below. The final program will be reported separately as required by Title 10 U.S. Code, Section 2350a(f). This program element funds the implementation of Air Force ICRD&A agreements in (1) Basic Research (2) Applied Research (3) Advanced Technology Development (4) Demonstration and Validation (5) Engineering and Manufacturing Development and (6)	onal cooperat he program in to improve co ficantly impr ch and develo ese funds wil ice, surveillan ce's Strategy of 2350a(f). Tl	ive research uplements to operation a ove US and opment effor a focus on ince, and record Global Enis program oment (4) D	y, developme he provision mong NAT( allied converts, acceleral mplementing onnaissance ngagement. element fun element fun hemonstration	ant, and acques of Title 10 D nations, and antional defecting the avaity coalition we (C31SR), mand The planner of the imple of the imp	uisition (ICI U.S. Code, and later majc anse capabili lability of darafrare techn odernization d program is amentation o atton (5) Eng	ND&A) agre Section 235 or non-NAT ties by lever efense syster ology and d and reading shown belo f Air Force gineering an	ements with to a slies, in raging the wms, and pror lemonstration as needs in the fina ICRD&A ag	NATO and Cooperative escarch, deveorable best deveorable best de moting US and in that addressupport of the program wigreements in uring Develop	
<b>99</b>	FY 1999 (\$ in Thousands) \$195 Effi (AF	Effects of the Ionosphere on Command, Control, Communications, and Intelligence (C3I) Systems (Air Force Research Laboratory (AFRL)/United Kingdom (UK)) - Cooperative project to leverage complementary ionospheric sensors and data to develop capabilities for timely	'ommand, Co	ntrol, Comi	munications, to leverage c	and Intellig	ence (C3I) Sary ionosphe	systems (Air	r Force Rese and data to d	arch Laborat levelop capak	ory oilities for timely
( <u>D</u> )	\$106	warning of ionosphere disturbances that disrupt C3I systems. In FY 99 the project installed ionospheric sensors on Guam to expand the coverage area for which C3I system outage forecasts and alerts can be provided; and the concept of a ground-based, rapidly deployable, Space Weather Station (SWS), employing multiple sensors and battlespace environment models to specify ionospheric and radio wave propagation conditions, was demonstrated in a field program on Ascension Island.  Free Piston Shock Tunnel (FPST)/High Enthalpy Goettingen Project (HEG) (Arnold Engineering and Development Center (AEDC)/Germany) - Cooperative project to significantly reduce the cost of acquiring technologies and ground test capabilities for the development of hypersonic flight systems by combining the complementary efforts of the US FPST and Germany's HEG facilities. In FY 99 the project tested the FPST and the HEG. Data reduction from the test entries was largely completed. Analyzed data on computational fluid dynamics (CFD), and CFD code development was accomplished. The final report has been drafted.	ances that dis age forecasts ltiple sensors ogram on As ST)/High En antly reduce to complement the test entral.	and alerts c and alerts c and battles cension Isla thalpy Goet the cost of i ntary efforts ies was larg report has b	es that disrupt C3I systems. In FN forecasts and alerts can be providule sensors and battlespace environ am on Ascension Island.  Whigh Enthalpy Goettingen Projectly reduce the cost of acquiring tectomplementary efforts of the US Fe test entries was largely completed. The final report has been drafted.	f 99 the pro- led; and the iment model at (HEG) (A hnologies ai 'PST and Ge ad. Analyze	ject installec concept of a ls to specify rnold Engin nd ground te rmany's HE d data on co	l ionospherio ground-bas ionospheric eering and I st capabiliti G facilities. mputational	ed, rapidly of and radio w and radio w Development es for the de In FY 99 th	Guam to ext leployable, S ave propagat t Center (AE) velopment of ne project tes nics (CFD), a	nces that disrupt C3I systems. In FY 99 the project installed ionospheric sensors on Guam to expand the coverage ge forecasts and alerts can be provided, and the concept of a ground-based, rapidly deployable, Space Weather iple sensors and battlespace environment models to specify ionospheric and radio wave propagation conditions, gram on Ascension Island.  T)/High Enthalpy Goettingen Project (HEG) (Arnold Engineering and Development Center (AEDC)/Germany) - ntly reduce the cost of acquiring technologies and ground test capabilities for the development of hypersonic complementary efforts of the US FPST and Germany's HEG facilities. In FY 99 the project tested the FPST and the test entries was largely completed. Analyzed data on computational fluid dynamics (CFD), and CFD code I. The final report has been drafted.
<u>q</u>	Project 64NATO			Page	Page 1 of 22 Pages	Ş			ш	xhibit R-2 (	Exhibit R-2 (PE 0603790F)

	RDT	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE February 2000
вире <b>04 -</b>	вирбет АСТІVІТУ <b>04 - Demonstratio</b> n	BUDGET ACTIVITY  04 - Demonstration and Validation  0603790F NATO Cooperative R&D	PROJECT <b>64NATO</b>
(n)	A. Mission Description Continued	tion Continued	
(E)	FY 1999 (\$ in Thousands) Continued	sands) Continued	
<b>(</b> £)	\$1,000	Dense Metal Case Penetrating Weapon (DMCPW) (AFRL/UK) - Cooperative project to develop and demonstrate technology for a dense metal penetrating warhead. This technology offers a two-fold increase in hard target penetration over current warhead case designs. The warhead will be compatible for carriage and release with future smaller aircraft, and stand-off weapons such as cruise missiles. Technology demonstration will be through sub-scale and full-scale dynamic ground impact testing (sled and/or powder gun). In FY 99 the project completed the DMCPW warhead detailed design, development, and fabrication of scaled/full scaled penetrator designs for the test program which will be accomplished in FY 00.	trate technology for a dense metal and case designs. The warhead will lies. Technology demonstration he project completed the DMCPW gram which will be accomplished
<u>5</u>	\$250	Cooperative Research and Development Efforts in Imaging Spectrometer Development (AEDC/Canada) - Cooperative project to pool the spatial and spectral advances of both the US and Canada, and develop a high-resolution sensor system capable of characterizing signatures of rockets and aircraft, for drug interdiction, and identifying trace quantities of a broad spectrum of gases in the environment. In FY 99 the project investigated data collection issues associated with imaging spectroscopy. Prototype data collection and analysis was accomplished.	operative project to pool the spatial aracterizing signatures of rockets ment. In FY 99 the project sis was accomplished.
5)	\$100	Metal Matrix Composites (MMCs) for Aerospace Applications (AFRL/UK) - Cooperative project to improve the properties and processing of silicon carbide (SiC) -reinforced Titanium (Ti) - alloy and Aluminum (Al) - alloy metal matrix composites for aerospace applications. In FY 99, the relationships between the structure and properties of carbon coatings were determined. Coating deposition parameters were defined. Carbon coated SiC fibers were produced by the UK and evaluated by the AFRL. Transverse testing of matrix-coated fibers were completed and specification of matrix-coated fibers were defined. A joint project to improve the mechanical properties of SiC-reinforced Al was defined and initiated.	the properties and processing of r aerospace applications. In FY 99, n parameters were defined. Carbon fibers were completed and iC-reinforced Al was defined and
5	\$105	Refractive Turbulence (AFRL/Australia) - Cooperative project to investigate specific and potential refractive turbulence-induced mission-limiting performance degradations on airborne military microwave radar surveillance, infrared (IR) laser and IR/microwave long range communication systems. The data reduction analysis and modeling of refractivity and turbulence measurements is essential to support studies that evaluate atmospheric refraction propagation effects on the design/performance of the Airborne Laser (ABL). In FY 99 the project supported data reduction and analysis of aircraft turbulence measurements in both Japan/Korea and Australia winter ietstreams.	turbulence-induced aser and IR/microwave long range nts is essential to support studies 3L). In FY 99 the project supported streams.
5	\$200	Integrated Tactical Aircraft Control (ITAC) Program (AFRL/France) - Cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package compromised of manned and uninhabited combat air vehicles (UCAVs). The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY 99 the project completed system level definition and intiated detailed design. The design approach is based on software agents. Twenty seven software agents were identified and development responsibilities assigned. The functional descriptions and initial input/output (I/O) definitions were defined for each agent. A common scenario was developed. Flight control algorithms, situation assessment methods, flight management and health monitoring system requirements were identified.	ate and demonstrate critical flight sed of manned and uninhabited tregrated strike package by the lesign. The design approach is signed. The functional descriptions light control algorithms, situation
Ā	Project 64NATO	Page 2 of 22 Pages	Exhibit R-2 (PE 0603790F)

	RDT&	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000
BUDG <b>04 -</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	and Validation	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT <b>64NATO</b>
(D)	A. Mission Description Continued	on Continued		
99	FY 1999 (\$ in Thousands) Continued \$300 Anthropometri three-dimensio the US; (b) hig database with 1	Anthropometric Accommodation in Crew Systems (AFRL/The Netherlands) - Cooperative project to establish (a) a collection of three-dimensional (3-D) anthropometric data which accurately and consistently describes the variability of men and women in both Europe and the US; (b) high quality methods for accommodation and interoperability assessment of crew systems; and (c) method for combining the database with the assessment methods to assure accommodation and interoperability is achieved in the design process. In FY 99 the project	RL/The Netherlands) - Cooperative project to establish curately and consistently describes the variability of mend interoperability assessment of crew systems; and (c) modation and interoperability is achieved in the design	h (a) a collection of en and women in both Europe and ) method for combining the process. In FY 99 the project
(0)	\$700	Innished 75% the US 3-D data collection and 25% of the European and initiated the augmented reality assessment of the aircraft crewstations. Advanced Hybrid Propulsion Technologies Cooperative Research Project (AFRL/Japan) - Cooperative project to develop hybrid propulsion technology for air-to-air missiles. In FY99 the project developed the subsystem components necessary to meet the overall project requirements of increased performance and safety, as well as providing energy management capability. The subsystem components include an injector, gas	le European and initiated the augmented reality assessne Research Project (AFRL/Japan) - Cooperative projec developed the subsystem components necessary to mengenerey management capability. The subsystem con	nent of the aircraft crewstations.  It to develop hybrid propulsion  et the overall project requirements  moonents include an injector, gas
<u> </u>	\$1,000	generator pressurization system, flow control valve, liquid oxidizer expulsion system, oxidizer chemistry development, and oxidizer tankage. Advanced Crew Ejection Seat (ACES) II - Ejection Seat Cooperative Modification Project (Human Systems Center (HSC)/Japan) - Cooperative project to develop and design a modification kit that can be retrofitted to the ACES II ejection seat to increase safety and survivability of light weight aircrew members by: increasing seat stability; increasing seat/accommodation range; and adding limb restraints. ACES II ejection seat	uid oxidizer expulsion system, oxidizer chemistry devent Cooperative Modification Project (Human Systems on the retrofitted to the ACES II ejection seat to increase increasing seat/accommodation range; and adding limb	elopment, and oxidizer tankage. Center (HSC)/Japan) - Cooperative safety and survivability of light restraints. ACES II ejection seat
<u>(5)</u>	\$3,956	improvements include a gender free operational capability to assure equally reduced mortality rate and serious injuries for male and female aircrew members. The completion of this program is intended to reduce the number of fatalities and serious injuries for all weight classes during high speed ejections and increase anthropometric range for aircrew population requirements. The design stages were completed and the qualification program will be initiated in FY 00.  Total	free operational capability to assure equally reduced mortality rate and serious injuries for male and fem ion of this program is intended to reduce the number of fatalities and serious injuries for all weight classes anthropometric range for aircrew population requirements. The design stages were completed and the itiated in FY 00.	s injuries for male and female njuries for all weight classes during ses were completed and the
99	FY 2000 (\$ in Thousands) \$213 Eff cap	Effects of the Ionosphere on C3I Systems (AFRL/UK) - Cooperative project to leverage complementary ionospheric sensors and data to develop capabilities for timely warning of ionospheric disturbances that disrupt C3I systems. In FY 00 a prototype ground-based SWS, employing	- Cooperative project to leverage complementary iono	spheric sensors and data to develop ound-based SWS, employing
(D)	\$100	multiple sensors and multiple battlespace environment models to specify ionospheric and radio wave propagation conditions, will be operated in the UK, to demonstrate its potential for future, in-theater support of operation C3I systems.  FPST/HEG Project (AEDC/Germany) - Cooperative project to significantly reduce the cost of acquiring technologies and ground test capabilities for the development of hypersonic flight systems by combining the complementary efforts of the US FPST and Germany's HEG facilities. Activities in FY 00 will include the final analysis of the data from the FPST and the HEG tests, final evaluation of non-intrusive	models to specify ionospheric and radio wave propaga er support of operation C3I systems. roject to significantly reduce the cost of acquiring tech stems by combining the complementary efforts of the lysis of the data from the FPST and the HEG tests, fina	ition conditions, will be operated in inclogies and ground test. US FPST and Germany's HEG il evaluation of non-intrusive
<u>5</u>	\$75	diagnostics in the laboratory shock tunnel, and the editing and final preparation of the report.  Geoscience Space Mission/Cooperative Space Measurements (AFRL/Germany) - Cooperative project to fly a Department of Defense developed space plasma detector aboard a German scientific spacecraft. Joint exchange and analysis of scientific data from this mission will be used to	ock tunnel, and the editing and final preparation of the report.  perative Space Measurements (AFRL/Germany) - Cooperative project to fly a Department of Defense develo German scientific spacecraft. Joint exchange and analysis of scientific data from this mission will be used to	a Department of Defense developed om this mission will be used to
ď	Project 64NATO	Page	Page 3 of 22 Pages	Exhibit R-2 (PE 0603790F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION S	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000
BUDG <b>04 -</b>	BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT <b>64NATO</b>
(£)	A. Mission Description Continued	ion Continued		
9	FY 2000 (\$ in Thousands) Continued develop better navigation cap.	descriptive and p	redictive models of the space environment, enhancing the reliability of space-based communications and S and its allies. In FY 99 the Flight Model of the plasma instrument was delivered to Germany for integration on	based communications and vered to Germany for integration on
<u>(</u>	\$334	board the satellite. Launch of the satellite is scheduled for FY 00.  Advanced Combustor Chamber Concepts Program (AFRL/France) - Cooperative project to develop and demonstrate a composite combustor structure suitable for use in advanced hypersonic weapon systems operation to Mach 8 on liquid hydrocarbon fuels. During FY 00 fabrication of a composite panel will be completed. Testing of this panel at Mach 7 flight conditions will demonstrate liquid hydrocarbon fuel-cooled	te satellite is scheduled for FY 00.  Concepts Program (AFRL/France) - Cooperative project to develop and demonstrate a composite combustor inced hypersonic weapon systems operation to Mach 8 on liquid hydrocarbon fuels. During FY 00 fabricatio leted. Testing of this panel at Mach 7 flight conditions will demonstrate liquid hydrocarbon fuel-cooled	onstrate a composite combustor fuels. During FY 00 fabrication of d hydrocarbon fuel-cooled
(U)	\$600	operation, thus paving the way for design and testing of a complete composite combustor section. Engines that utilize this type of composite structure will be simpler, easier to cool, lower weight, and more durable than baseline metallic designs.  ITAC Program (AFRL/France) - Cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package comprised of manned and UCAVs. The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY 00 work will continue in the	for design and testing of a complete composite combustor section. Engines that utilize this type of compo to cool, lower weight, and more durable than baseline metallic designs.  - Cooperative project to develop, integrate and demonstrate critical flight control and flight management ative flight operations of a package comprised of manned and UCAVs. The cooperative control architect of an integrated strike package by the aircrews in the combat aircraft. In FY 00 work will continue in the	at utilize this type of composite trol and flight management ooperative control architecture 00 work will continue in the
<u>(5)</u>	\$300	development of the agent/algorithms. Functional descriptions of the agents and their interrelationships will be further refined. A desktop development tool/simulation will be the initial product supporting evaluation of the design and early demonstration of it's utility. Anthropometric Accommodation in Crew Systems (AFRL/The Netherlands) - Cooperative project to establish (a) a collection of three-dimensional (3-D) anthropometric data which accurately and consistently describes the variability of men and women in both Europe and the US; (b) high quality methods for accommodation and interoperability assessment of crew systems; and (c) methods for combining the	ptions of the agents and their interrelationships will b upporting evaluation of the design and early demonst XL/The Netherlands) - Cooperative project to establis arately and consistently describes the variability of m d interoperability assessment of crew systems; and (c	e further refined. A desktop ration of it's utility. h (a) a collection of en and women in both Europe and methods for combining the
<u>6</u>	\$400	database with the assessment methods to assure accommodation and interoperability is achieved in the design process. In FY 00 the project will finish both the US and the Dutch data collection, the augmented reality assessment of the aircraft crewstations, and perform accommodation effect assessments using US and Dutch data sets.  Aging Aircraft Life Prediction/Extension (AFRL/Australia) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs of metallic structures, widespread fatigue damage including multiple-element damage and multiple site damage, techniques for predicting the effects of corrosion and the interaction with fatigue loads, and sensors for structural health monitoring. In FY 00 the project will	nodation and interoperability is achieved in the design gmented reality assessment of the aircraft crewstation lia) - Cooperative project to investigate the damage thintegrity of aging aircraft with such damage present. It lamage including multiple-element damage and multiple th fatigue loads, and sensors for structural health mor	i process. In FY 00 the project will s, and perform accommodation at can degrade an aircraft's service. This project will focus on composite ple site damage, techniques for iitoring. In FY 00 the project will
<u> </u>	\$350	complete documenting experience with widespread fatigue damage and composite patch repairs, continue developing analysis techniques for corrosion/fatigue, continue evaluating composite patch repair and analysis techniques, and perform in-service evaluation of corrosion sensor. Structural Integrity of Aging Aircraft (AFRL/Canada) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs for metallic structures, widespread fatigue damage, life extension techniques for metallic structures, corrosion and its interaction	the damage and composite patch repairs, continue deversair and analysis techniques, and perform in-service Cooperative project to investigate the damage that ca grity of aging aircraft with such damage present. This damage, life extension techniques for metallic struct.	reloping analysis techniques for evaluation of corrosion sensor. In degrade an aircraft's service life, i project will focus on composite ures, corrosion and its interaction
ď	Project 64NATO	Page 4	Page 4 of 22 Pages	Exhibit R-2 (PE 0603790F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit) February 2000	000
BUDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE  0603790F NATO Cooperative R&D	PROJECT 64NATO
<b>E</b>	A. Mission Description Continued	ion Continued	
<u>5</u>	FY 2000 (\$ in Thousands) Continued with fatigue, st development.	ands) Continued with fatigue, structural dynamics with emphasis on weapon bay acoustics, and structural health monitoring with emphasis on sensor develonment. In FY 00 the project will develop analytical models for widespread fatigue damage and corrosion/fatigue, complete evaluation of	aluation of
5	\$250	composite patch repair techniques, and identify in-service dynamic problems.  Airworthiness of Aging Aircraft (AFRL/UK) - Cooperative project to investigate the damage that can degrade an aircraft's service life, and develop the technology to ensure the structural integrity of aging aircraft with such damage present. This project will focus on composite patch repairs for metallic structures, techniques for predicting the effects of corrosion and the interaction with fatigue loads, and structural life	e, and osite patch ife
9	\$250	extension techniques for metal structures, such as the fastener-hole cold expansion process. In FY 00 the project will continue analysis techniques for corrosion/fatigue and continue developing analysis techniques for life enhancement and composite patch repairs.  Air Command, Control, Communications and Intelligence (C31) Capabilities (Electronic Systems Center (ESC)/NATO Consultation, Command, and Control (C3) Agency) - Cooperative project to develop an operationally robust interface between the US Contingency Theater Automated Planning System/Theater Battle Management Core System (CTAPS/TBMCS) and NATO Initial Combined Air Operations Center (CAOC) Capability (ICC) as well as the future NATO Air Command and Control System (ACCS). This cooperative R&D effort will support air campaign	iis Command, utomated AOC)
<u>(</u> 2)	\$250	planning and execution for joint and combined air operations. The scope of work to be accomplished includes advanced R&D into shared data environment, developing a concept of operation for the transfer of control between national and NATO C4I systems without interupting combat operations; and the extension of a middleware/translator product needed for the successful prosecution of a combined/joint air operation. Coalition C3 Demonstration Environment (CC3DE) (AFRL/Australia, Canada) - Cooperative project to improve the efficiency of future coalition operations capabilities through the development of interoperable C3. This project will initially explore the effective management of information system resources in a coalition environment. It will develop a management architecture for the coalition environment, and develop the tools to implement this architecture. In particular, Asynchronous Transfer Mode (ATM) technology wil be integrated into a Broadband-Integrated	nared data ing combat ion.  ure coalition information te tools to
(5)	\$250	Services Digital network (B-ISDN) in efforts to form a common international standard for networking. In FY 00 this project will attach a management node to Combined Federated Battle Lab Network (CFBLNet) in order to investigate/experiment with Coalition network management (CNM) issues.  Advanced Transmission Language and Allocation of New Technology for International Communication and Proliferation of Allied Waveforms (ATLANTIC PAW) (AFRL/France, Germany, UK) - Cooperative project to develop a common waveform syntax allowing for joint allied communications that will be demonstrated on programmable radio systems in each of the participating nations. Joint compliance testing commenced in FY 99 and will be completed this year with multinational communication assets to assure interoperability on a functional level. In FY 00 joint compliance testing will be conducted by using the previously designed Future Multiband Multiwaveform Modular Tactical Radio (FM3TR) waveform and newly designed multinational radio platforms. This compliance test will verify the interoperability of the basic	sch a  Vaveforms  Allied  ting  mal level.  ctical Radio
ā	Project 64NATO	Page 5 of 22 Pages Exhibit R-2 (PE 0603790F)	)603790F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	R-2 Exhibit)	E February 2000
BUDC <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT <b>64NATO</b>
(n)	A. Mission Description Continued	ion Continued		
9	FY 2000 (\$ in Thousands) Continued equipment that international a	is required for th greement. The in	e Atlantic Paw effort. Modifications resulting from the compliance testing will be integrated into the itial design and tool characterization of the international waveform interpreter and language developm	e integrated into the d language development will
(j)	\$100	also commence in this year.  Space Radiation Sensors (AFRL/UK) - Cooperative project to validate the performance of a key Air Force spacecraft instrument for the measurement of space environment radiation hazards. The instrument's capability of issuing real-time space hazard warnings will be tested under a variety of conditions encountered in space aboad a joint US/UK satellite mission. In FY 00 the project will develop the preliminary	e the performance of a key Air Force spacer's capability of issuing real-time space hazer's satellite mission. In FY 00 the project w	craft instrument for the ard warnings will be tested ill develop the preliminary
(5)	\$250	space radiation data base using the US and UK instruments. Final verification of the US instrument's calibration will be performed using the preliminary data base.  Distributed Mission Training (DMT) Technologies (AFRL/Canada) - Cooperative project to develop DMT technologies that will enhance allied simulator based training of US and Canadian fighter aircrews and demonstrate proof of concept. DMT refers to shared training environment comprised of live, virtual, and constructive simulations allowing warfighters to train individually or collectively at all levels of war. In FY 00 the	ification of the US instrument's calibration Cooperative project to develop DMT techn nonstrate proof of concept. DMT refers to sighters to train individually or collectively a	will be performed using the ologies that will enhance allied shared training environment at all levels of war. In FY 00 the
(D)	\$300	project will initiate efforts to convert and rehost CF-18 software to multi-task trainer format, and conduct visual perception and engineering research efforts to specify design requirements for ultra-high resolution visuals for DMT flight simulators. Scintillation Impacts on Communication and Navigation Systems (AFRL/Australia) - Cooperative project will exchange data, deploy current sensors, develop improved sensors, and tailor current decision aids, including software, which relate to ionospheric phenomena and their effect on C3I systems. This project will provide the US critical access to data in regions of strategic interest in South East Asia and the South Pacific	ulti-task trainer format, and conduct visual I in visuals for DMT flight simulators.  RL/Australia) - Cooperative project will excluding software, which relate to ionospher in regions of strategic interest in South E	change data, deploy current ic phenomena and their effect ast Asia and the South Pacific
(5)	\$200	where large ionospheric disturbances routinely occur. FY 00 activities include the deployment of 1-2 sensors for monitoring scintillation on UHF Satellite Communication links at existing Australian sites. Real-time data retrieval will be implemented at these sites for ready data access and prototype operational support. Routine data collection will be initiated. Flight Test Demonstration of Miniature Munitions Release from Internal Weapons Bay (AFRL/Australia) - This project will validate store separation simulation codes for the release of miniature munitions from internal weapons bays at both subsonic and supersonic airspeeds. The validated trajectory simulation codes will support the store certification efforts for aircraft such as the F-22, Joint Strike Fighter, and Unmanned	s include the deployment of 1-2 sensors for time data retrieval will be implemented at riated. nal Weapons Bay (AFRL/Australia) - This m internal weapons bays at both subsonic a m efforts for aircraft such as the F-22, Joint	monitoring scintillation on these sites for ready data access project will validate store nd supersonic airspeeds. The Strike Fighter, and Unmanned
5	\$4,222	Combat Air Venicles. The Koyal Australian Air Force (KAAF) F-111G is the only available operational fighter/bomber, with an internal bay, capable of dropping internally carried munitions at subsonic and supersonic velocities.  Total	O is the only available operational fighter/reonic velocities.	bomber, with an internal bay,
ď	Project 64NATO	Page 6 of 22 Pages		Exhibit R-2 (PE 0603790F)

	RDT	RDT&E BUDGET ITEM JUSTIFICATION S	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000
BUDG <b>04 -</b>	BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT <b>64NATO</b>
മ	A. Mission Description Continued			
9	FY 2001 (\$ in Thousands)			
<b>5</b>	\$200	Effects of the Ionosphere on C3I Systems (AFRL/UK) - Cooperative project to leverage complementary ionospheric sensors and data to devel capabilities for timely warning of ionospheric disturbances that disrupt C3I systems. In FY 01, a new sensing technique employing HF ionosounding data to provide (advanced) forecasts of ionospheric disturbance conditions that will affect C3I systems and operations will be demonstrated; and UK oblique High Frequency propagation data and ionospheric total-electron-content (tomography) data will be used to validate the Space Weather concept for real-time specification of the in-theater battlespace environment affecting C3I systems and operations.	Systems (AFRL/UK) - Cooperative project to leverage complementary ionospheric sensors and data to develop fionospheric disturbances that disrupt C3I systems. In FY 01, a new sensing technique employing HF vanced) forecasts of ionospheric disturbance conditions that will affect C3I systems and operations will be igh Frequency propagation data and ionospheric total-electron-content (tomography) data will be used to ent for real-time specification of the in-theater battlespace environment affecting C3I systems and operations.	technique employing HF stems and operations will be graphy) data will be used to C31 systems and operations.
<u>(</u>	\$400	ITAC Program (AFRL/France) - Cooperative project to develop, integrate and demonstrate critical flight control and flight management technologies that enable cooperative flight operations of a package comprised of UCAVs. The cooperative control architecture enables management and control of an integrated strike package by the aircrews in the combat aircraft. In FY 01 agent integration and development refinement will continue culminating in a real-time simulation. The man-in-the-loop evaluation & demonstration phase will begin in FY 01.	develop, integrate and demonstrate critical flight contra package comprised of UCAVs. The cooperative contray the aircrews in the combat aircraft. In FY 01 agent ation. The man-in-the-loop evaluation & demonstrati	rol and flight management of architecture enables integration and development on phase will begin in FY 01.
<u>(</u> )	\$300	Anthropometric Accommodations in Crew Systems (AFRL/The Netherlands) - Cooperative project to establish (a) a collection of three-dimensional (3-D) anthropometric data which accurately and consistently describes the variability of men and women in both Europe and the US; (b) high quality methods for accommodation and interoperability assessment of crew systems; and (c) methods for combining the database with the assessment methods to assure accommodation and interoperability is achieved in the design process. In FY 01 the project will	RL/The Netherlands) - Cooperative project to establish rately and consistently describes the variability of mer interoperability assessment of crew systems; and (c) odation and interoperability is achieved in the design p	n (a) a collection of n and women in both Europe and methods for combining the process. In FY 01 the project will
<u>(b)</u>	\$351	Inish the European data collection, and perform accommodations effects assessments using the European data.  Air C3I Capabilities (ESC/NATO C3 Agency) - Cooperative project to develop an operationally robust interface between the US CTAPS/TBMCS and NATO Initial CAOC ICC and the future NATO ACCS. This cooperative R&D effort will support air campaign planning and execution for joint and combined air operations. In FY 01 work will entail: 1. producing the C2 interface between fielded systems; 2. harmonization of system data base structures as part of the shared data environment; and 3. evaluating and implementing the reuse of appropriate functional modules.	nodations effects assessments using the European data, ative project to develop an operationally robust interfauture NATO ACCS. This cooperative R&D effort wil Y 01 work will entail: 1. producing the C2 interface he shared data environment; and 3. evaluating and imp	ice between the US I support air campaign planning setween fielded systems; 2.
<b>(</b> 2)	\$500	CC3DE (AFRL/Australia, Canada) - Cooperative project to improve the efficiency of future coalition operations capabilities through the development of information system resources in a coalition environment. It will develop a management architecture for the coalition environment, and develop the tools to implement this architecture. In particular, Asynchronous Transfer Mode (ATM) technology will be integrated into a Broadband-Integrated Services Digital network (B-ISDN) in efforts to form a common international standard for networking. In FY 01 the project will integrate management functionality being developed by	to improve the efficiency of future coalition operation. Ily explore the effective management of information s for the coalition environment, and develop the tools to ogy will be integrated into a Broadband-Integrated Serorking. In FY 01 the project will integrate managemen	ns capabilities through the system resources in a coalition o implement this architecture. In rvices Digital network (B-ISDN) in t functionality being developed by
<u> </u>	\$850	individual nations into a CNM demonstrator and conduct experiments accordingly.  ATLANTIC PAW (AFRL/France, Germany, UK) - Cooperative project to develop a common waveform syntax allowing for joint allied communications that will be demonstrated on programmable radio systems in each of the participating nations. The waveform interpreter design will be completed in addition to the initial specifications of the waveform language. The development of both of these subsystems will	demonstrator and conduct experiments accordingly.  See, Germany, UK) - Cooperative project to develop a common waveform syntax allowing for joint allie nonstrated on programmable radio systems in each of the participating nations. The waveform interpre the initial specifications of the waveform language. The development of both of these subsystems will	x allowing for joint allied The waveform interpreter design of these subsystems will
P	Project 64NATO	Page 7 c	Page 7 of 22 Pages	Exhibit R-2 (PE 0603790F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	DATE	February 2000
BUDG 04 -	BUDGET ACTIVITY  04 - Demonstration	BUDGET ACTIVITY  0603790F NATC	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	PROJECT <b>64NATO</b>
9	A. Mission Description Continued	tion Continued		
Ð	FY 2001 (\$ in Thousands) Continued	thy in each count	ry and this will include software cost and support integration into the various host nations systems. Preliminary	ms. Preliminary
<u>(</u>	\$658	testing of portions of the system components will be preformed to mitigate integration risks.  Observations and Modeling for Space Weather (AFRL/Germany) - Cooperative project to forecast the global ionosphere and satellite drag using US and German satellite sensors and experiments to provide coordinated observations of solar impact on the space environment. In FY 01 the project will make improvements in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment; support on-orbit in the use of currently available sensor data to drive models of the space environment in the use of currently available sensor data to drive models of the space environment.	Space Weather (AFRL/Germany) - Cooperative project to forecast the global ionosphere and satellite drag using s and experiments to provide coordinated observations of solar impact on the space environment. In FY 01 the s in the use of currently available sensor data to drive models of the space environment; support on-orbit	atellite drag using  nt. In FY 01 the t on-orbit
( <u>C</u> )	\$200	operations of and analyze data from the Defense Meteorological Satellite Program (DMSP).  Space Radiation Sensors (AFRL/UK) - Cooperative project to validate the performance of a key Air Force spacecraft instrument for the measurement of space environment radiation hazards. The instrument's capability of issuing real-time space hazard warnings will be tested under a variety of conditions encountered in space abroad a joint US/UK satellite mission. In FY 01 the project will begin the development of the	(DMSP).  a) (DMSP).  performance of a key Air Force spacecraft instrume apability of issuing real-time space hazard warnings are little mission. In FY 01 the project will begin the	nt for the will be tested development of the
<u>(</u>	\$500	final radiation database. The database will be completed in FY 02.  DMT Technologies (AFRL/Canada) - Cooperative project to develop DMT technologies that will enhance allied simulator based training of US and Canadian fighter aircrews and demonstrate proof of concept. DMT refers to a shared training environment comprised of live, virtual, and contructive simulations allowing warfighters to train individually or collectively at all levels of war. In FY 01 the project will complete software contructive simulations allowing warfighters to train individually or collectively at all levels of war. In FY 01 the project will complete software	T technologies that will enhance allied simulator bas sfers to a shared training environment comprised of L ctively at all levels of war. In FY 01 the project will amignified and sirces than desired than the project will approximate and sirces than the project will approximate and sirces than the project will approximate and sirces the product of the project will approximate and sirces the project will approximate and sirces the project will be a sirces the project will be a single than the single than the project will be a single than the single than th	ted training of US ive, virtual, and complete software
<u>D</u>	\$200	conversion and renost efforts, develop a DM1 control station, initiate inodefination emailies and anotation that was continued in the CF-18 Multi-Task Training, and continue visual research and development activities.  Refraction and Propagation Modeling for Microwave Systems (AFRL/Australia, UK) - Cooperative project to combine a low cost refraction measurement capability and parabolic equation methods of microwave propagation modeling for evaluating refraction conditions that result in	opment activities.  Stralia, UK) - Cooperative project to combine a low opagation modeling for evaluating refraction condition	cost refraction ons that result in
<u>(i)</u>	\$400		energy microwave and mita-red systems.  tt to develop life extension techniques and strategies orce F100, -220 and -229 and F101 and Australia's T	that can be applied F30, F404 and
<u>(c)</u>	\$400	T700. Much of the technology will be generic and flow from one engine to another. Effects of lonization on Hydrocarbon Combustion (AFRL/UK) - Cooperative project to investigate the effects of weak ionization on hydrocarbon carbon are mixture reaction time, and develop promising pilots/flameholders, including plasma ignitors which can be incorporated into scramjet engines. The research will investigate techniques to decrease the time for fuel ignition, and increase the rate of combustion to facilitate high speed propulsion. Other generic requirements to be addressed include extending the altitude range for airbreathing propulsion and providing physically smaller combustors to reduce the associated weight and cooling penalties. In FY 01 the project will complete fundamental reaction rate measurements in fast flow tube experiments, design plasma generators for burner experiments, and begin to update and improve	will be generic and flow from one engine to another.  arbon Combustion (AFRL/UK) - Cooperative project to investigate the effects of weak ionization on in time, and develop promising pilots/flameholders, including plasma ignitors which can be incorporated into will investigate techniques to decrease the time for fuel ignition, and increase the rate of combustion to facilitate eneric requirements to be addressed include extending the altitude range for airbreathing propulsion and mbustors to reduce the associated weight and cooling penalties. In FY 01 the project will complete fundamental ast flow tube experiments, design plasma generators for burner experiments, and begin to update and improve	ion on corporated into ustion to facilitate lision and plete fundamental te and improve
ď	Project 64NATO	Page 8 of 22 Pages	Exhibit R-2	Exhibit R-2 (PE 0603790F)

	RDT	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)		DATE February 2000	000
800 <b>94</b>	вирсет астилту 04 - Demonstration and Validation	and Validation	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	perative R&D	<b>)</b>	PROJECT 64NATO
9	A. Mission Description Continued	ion Continued				
9	FY 2001 (\$ in Thousands) Continued	ands) Continued				
<u>5</u>	\$250	computational predictive and design tools.  Distributed Mission Training (DMT) and Virtual Air Environment (VAE) Technologies (AFRL/Australia) - Cooperative project to develop DMT and VAE technologies that will enhance allied simulator based training of US and Australian fighter aircrews and demonstrate proof of concept.	sign tools.  MT) and Virtual Air Environment (VAE) Technologies (AFRL/Australia) - Cooperative project to develop DM enhance allied simulator based training of US and Australian fighter aircrews and demonstrate proof of concept.	s (AFRL/Australia) - ralian fighter aircrew	<ul> <li>Cooperative project to deverse and demonstrate proof o</li> </ul>	velop DMT f concept.
		In FY 01 the project will initiate efforts to convert and rehost Australian F-18 software to multi-task trainer format, continue visual perception and engineering research efforts to specify design requirements for ultra-high resolution visuals for DMT flight simulators, and continue	efforts to convert and rehost Australian F-18 software to multi-task trainer format, continue visual perce to specify design requirements for ultra-high resolution visuals for DMT flight simulators, and continue	to multi-task trainer n visuals for DMT fli	format, continue visual per ight simulators, and contin	rception ue
9	\$300	long-naul networking and constructive forces development activities.  Scintillation Impacts on Communication and Navigation Systems (AFRL/Australia) - Cooperative project will exchange data, deploy current	oment activities. ion Systems (AFRL/Australia) -	Cooperative project v	will exchange data, deploy	current
		sensors, develop improved sensors, and ranor current decision ards, including software, which relate to follospheric phenomena and their effect on C31 systems. This project will provide the US critical access to data in regions of strategic interest in South East Asia and the South Pacific	ical access to data in regions of st	rategic interest in So	uth East Asia and the Sout	h Pacific
		where large ionospheric disturbances routinely occur. In FY 01 data collection will continue and 1-2 additional sites will be brought on-line; characterization of ionospheric disturbances in the region and assessment of their impacts on space-based navigation, communications and surveillance systems will be conducted. An intensive multiple-diagnostic measurement campaign will be performed during active scintillation	In FY 01 data collection will co gion and assessment of their impa multiple-diagnostic measuremen	ntinue and 1-2 additions on space-based not campaign will be pe	onal sites will be brought o avigation, communications erformed during active scir	n-line; ; and ntillation
9	85,509	perious to entrance our universiantum of the physical inectianisms reading to the development of severe equatorial distuitories.  Total	inculations reading to the devel	ישוזיכווו סו אפעפופ פלומי	atorial disturbances.	
9	•	B. Budget Activity Justification This PE is designated in Budget Activity 4 because most of the ICRD&A projects support specific systems, include all efforts necessary to evaluate integrated	ojects support specific systems, in	iclude all efforts neco	essary to evaluate integrate	Ď
9		C. Program Change Summary (\$ in Thousands)	FV 1999	FV 2000	FV 2001	Total Cost
9		Previous President's Budget (FY 2000 PBR)	4,105	4,283	5,558	21,257
3			4,117	4,283		
9		opriated Value				•
	a. Congressional/General Reductions	neral Reductions	-12			
	b. Small Business Innovative Research	novative Research	-127			
	c. Omnibus or Other	c. Omnibus or Other Above Threshold Reprogram		-34		
	d. Below Threshold Reprogram	Reprogram	;	!		
	e. Rescissions		-22	-27		
	f. Other					
<u></u>	Project 64NATO	Page	Page 9 of 22 Pages		Exhibit R-2 (PE 0603790F)	303790F)

	RDT&E BUDGET ITEM JU	M JUSTIF	ICATION	STIFICATION SHEET (R-2 Exhibit)	R-2 Exhi	bit)		DATE February 2000	7 2000
80D <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603790F NATC	AND TITLE : NATO C	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	R&D		PROJECT <b>64NATO</b>
<b>(</b> 2)	C. Program Change Summary (\$ in Thousands) Continued	nds) Continued			FY 1999	FY 2000		FY 2001	Total Cost
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR	BR			3,956	4,222	1	-49 5,509	21,257
9	Significant Program Changes: Change Summary Explanation: N/A								
<u> </u>	D. Other Program Funding Summary (\$ in Thousands)  EY 1999 FY 2000  Actual Estimate	housands) FY 2000 Estimate	EY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	EY 2005 Estimate	Cost to. Complete	Total Cost
99	N/A Related RDT&E: (U) This program element provides It programs. Management support for A per fiscal year.	unds for USAF	Laboratory 6. iive R&D PE	.1 through 6.3 <sub>1</sub> 0603790F is fu	orograms and	USAF Product, orce Internation	, Test, and Lo	r USAF Laboratory 6.1 through 6.3 programs and USAF Product, Test, and Logistics Center 6.4 through 6.5 Cooperative R&D PE 0603790F is funded in Air Force International Activities PE 1001004F at the level of \$300	through 6.5 e level of \$300
9	A principal goal of the NATO Cooperative R&D program is to effectively utilize the aggregate resources invested by the US and our allies in conventional defense R&D. This program element provides the critical funding incentive needed to pursue ICRD&A agreements and helps to (a) leverage USAF and allied resources through cost sharing and economies of scale; (b) exploit the best US and allied technologies for equipping coalition forces; (c) demonstrate areas of commonality or interoperability with our allies; and (d) accelerate the availability of defense technology and systems. Candidate projects are reviewed and approved by the USD(A&T). An international agreement defining project objectives, responsibilities and costs is required prior to release of funds. To obtain these funds and ensure service commitment, projects are selected from existing or new RDT&E programs funded in the Future Years Defense Plan (FYDP). Project offices must show matching funds and contributions from associated program elements and equitable allied funding. As appropriate, funding responsibility for out-year requirements and follow-on efforts are transferred to the project office and associated program elements. Most contracts are awarded after full and open competition.	D program is to ing incentive ne sest US and alli, y of defense tec silities and costs s funded in the d funding. As a Most contracts	effectively ut seded to pursu ed technologiand shoology and s is required p Future Years I	ilize the aggregent ICRD&A aggregent of the state of the systems. Candingrior to release of Defense Plan (Inding responsibility)	gate resources reements and I g coalition for date projects a of funds. To o FYDP). Projectitity for out-yen competitic	invested by the helps to (a) leve ces; (c) demoning reviewed an obtain these funct offices must year requirements.	US and our : erage USAF & strate areas old approved by ds and ensure show matchints and follow nts and follow	am is to effectively utilize the aggregate resources invested by the US and our allies in conventional defense R& and allied resources through cost and allied technologies for equipping coalition forces; (c) demonstrate areas of commonality or interoperability ense technology and systems. Candidate projects are reviewed and approved by the USD(A&T). An internation and costs is required prior to release of funds. To obtain these funds and ensure service commitment, projects are in the Future Years Defense Plan (FYDP). Project offices must show matching funds and contributions from a. As appropriate, funding responsibility for out-year requirements and follow-on efforts are transferred to the contracts are awarded after full and open competition.	al defense R&D. s through cost nteroperability An international ent, projects are ibutions from nsferred to the
9	F. Schedule Profile			FY 1999		FY 2000	000	旺	FY 2001
	Project 64NATO		Page	Page 10 of 22 Pages	,,			Exhibit R-2 (P	Exhibit R-2 (PE 0603790F)
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	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-;	Exhib	Ē		DATE		February 2000	
BUE <b>9</b>	вирсет астіvіту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATC	⊓TLE ATO Co	opera	⊌D TITLE NATO Cooperative R&D			PRO <b>64</b> N	PROJECT <b>64NATO</b>
(3)	F. Schedule Profile Continued	FY 1999 2 3	4	<b>H</b> 2	FY 2000	4		EY 2001 2 3	4
99	Effects of the Ionosphere on C3I Systems Project Couple ray-trace/ionospheric model			ı					
<u> </u>	Assemble ground-based SWS  Expand C3I outage alert coverage to include South Pacific sector  SWS data acquisition campaign in UK  Develop HF sounding technique to forecast scintillation conditions  Field demonstration of HF scintillation forecasting techniques	*	*		×	×		×	
3933	Employ UK sensor data to validate/expand SWS C3I support concept DMCPW Project Preliminary design	*							×
333	Detailed design, development, and ground testing System analyses and material tests Cooperative R&D Efforts in Imaging Spectrometer Development	*	×	×	××				
5555	Project Preliminary design Concept checkout Brassboard Development & Checkout	*	*		×	<b>&gt;</b>			
999999	Instrument Posign  Lab Instrument Fabrication & Checkout Instrument Ruggedization  Field Demonstration  MMCs for Aerospace Application Project  Concept definition	*				<b>(</b>		×	××
£555	Produce and evaluate MMCs Specify improved MMCs Produce and evaluate improved MMC FPST/HEG Project				×			×	
Ð	*  Calibration, fabrication of models, testing  Project 64NATO	* Page 11 of 22 Pages					Exhibit	Exhibit R-2 (PE 0603790F	790F)
		607							

tion and Validation         FEX LISSOR         NATIO Goognerative R&D           offle Continued         1         2         3         4         1         2         3           third dynamics code development and validation         *         *         X         X           ation on Hydrocarbon Combustion Project         *         X         X           east rements         *         X         X           generator         computational tools         *         X           ce Mission/Cooperative Space Measurements Project         *         X           ed         *         X         X           and test         *         X         X           ed test         *         X         X           and test         *         X		RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	IS NO	HEET (R	-2 Ext	hibit)			DATE		February 2000	8	
Exchange instrumentation and diagnostic articles  Computational fluid dynamics code development and validation  Exchange consultations articles  Computational fluid dynamics code development and validation  Final report  Agreement signed  Agreement signed  Agreement signed  Begin updating computational tools  Coocierce Space Mission/Cooperative Space Measurements Project  Begin updating computational tools  Coocierce Space Mission/Cooperative Space Measurements Project  Begin updating computational tools  Coocierce Space Mission/Cooperative Space Measurements Project  Begin updating computational tools  Coocierce Space Mission/Cooperative Space Measurements Project  Begin updating computational tools  Coocierce Space Mission/Cooperative Space Measurements Project  Agreement signed  Delivery to spacecraft integrator  Spaceraft integrator  Spaceraf	BUI <b>9</b>	обет астіvіту - Demonstration and Validation	0	E NUMBER ANI <b>603790F</b>	D TITLE	Coop	erativ	e R&D			В	PROJECT <b>64NATO</b>	ုဝ
Exchange instrumentation and diagnostic articles  Computational fluid dynamics code development and validation  Exchange consultations Final report Final report Final report Agreement signed Reaction rate measurements  Begin updaing computational tools  Geoscience Space Mission/Cooperative Space Measurements Project  Development and test  Development and test  Agreement signed  Delivery to spacecraft integrator  Spacecraft integration and test  Launch  Data collection  Refractive Turbulence Project  Flight measurements  Advanced Combustor Chamber Concepts Project  Field measurement reports  Data analysis  Advanced Combustor Chamber Concepts Project  Field measurement rests  Advanced Combustor Chamber design and fabrication  Cooled panel tests  Combustor cooled panel tests  Combustor colled panel tests  Combustor colled panel tests  Combustor chamber tests  Project AdvAtTO  Page 272 Pages  Advanced Combustor Chamber tests  Combustor chamber tests	<b>9</b>		-	661 X	_	-	FY	2000	<del>-</del>	-	FY 2001		_
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Combustor chamber tests  Project 64NATO	5	_									×	•	!
	9`_	_											×
		Project 64NATO	Page 12 (	of 22 Pages						Exhibit F	Exhibit R-2 (PE 0603790F)	03790	

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R	-2 Ex	hibit)			DATE		February 2000	00	
BQ <b>4</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATC	D TITLE NATO	Coop	ир тіть NATO Cooperative R&D	R&D				PROJECT 64NATO	_ 0
(c)	F. Schedule Profile Continued	1000			)C XII	9			1000 184		
	1	2 3	4		2 2 3	∄ °°	4		2 2 2001	<b>1</b> დ	4
9	ITAC Project										
<u> </u>	System definition *	*									
9	System design	*	*								
<u>e</u>	Detailed design		*				×				
<u> </u>	System mechanization						×		×		
9	Simulation and Evaluation							×		^	×
9	DMT Technologies Project										
9	Agreement signed			×							
9	Program start					×					
<u> </u>	CF-18 software conversion					×			×		
9	Software rehost					×				^	×
<u> </u>	Instructor operator control station								×	×	×
9	CF-18 modernization enhancements							×			
9	Aircraft hardware/emulation integration									^	×
9	Visual research					×					
9	Anthropometric Accommodation in Crew Systems Project										
9	Conduct anthropometric survey								×		
9	Assess subjects in actual cockpits	*									
9	Assess one model in the US and one model in The Netherlands	*	*								
<u> </u>	Augmented reality assessments		*			×					
<u> </u>	3-D data reduction			×		×					
<u> </u>	Compare live subject, computer model, and augmented reality results					×	×				·
9	Comparison of data from The Netherlands with the US					×			×		
9	Structural Integrity of Aging Aircraft Project										
<u> </u>	Develop widespread fatigue damage analytical models				×	×	×				
9	Develop corrosion/fatigue analysis techniques		*					×			
9	Evaluate composite patch analysis techniques for metallic structures		*	×	×						
9	Identify candidate solutions for dynamic control	*	*	×							
	Project 64NATO Page	Page 13 of 22 Pages						Exhibit F	Exhibit R-2 (PE 0603790F	303790F	Œ

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	ON SHEET (R	-2 Exhit	) Sit			DATE	Febr	February 2000	00	
80D	BUDGET ACTIVITY   04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATC	ЮТІТІЕ NATO Cooperative R&D	oper	ative R	&D				PROJECT 64NATO	. D
<b>(</b>	F. Schedule Profile Continued	FY 1999			EY 2000				EY 2001		
		1 2 3	4	_	2 3	4		-	2 3	~	4
93	Identify fatigue life enhancement techniques				^	×					
9	Airworthiness of Aging Aircraft Project					نو		<b>\$</b>	<b>;</b>		
9	Develop lite enhancement analysis techniques					<b>*</b>		<b>*</b>	<b>×</b>		
<u> </u>	Conduct experiments Document corrosion/fations service		*	×		Κ,		<b>~</b>			
3	Aging Aircraft Life Prediction/ Extension Project		•	<u>.</u>							
3	Coordinate with US	*				×					
9	Develop corrosion/fatigue analysis techniques		*					×			
9	Evaluate composite patch analysis techniques for metallic structures		*	×	×						
9	Prepare for flight tests				^	×					
3	Advanced Hybrid Propulsion Technologies Cooperative Research										
	Project										-
9	Detail design	*			^	×					
3	Oxidizer expulsion system	*	*								
9	Controls	*			^	×					
3	Injector				×						
3	Pressurization system		*		^	×					
9	Oxidizer development	*									
3	Integrate subsystems				×	×					
9	Determine suitability for integrated testing					^			×	<u>.</u>	;
<u> </u>	Conduct integrated testing								~	×	<b>×</b> ;
<u> </u>	Data analysis and reporting										×
€	ACES II - Ejection Seat Cooperative Modification Project Detailed decim	*									
E	Complete design		·	×							
33	Complete joint sled testing		•	<u>.</u>					^	×	
3	Complete USAF OT&E										×
3	Space Radiation Sensors Project										
<u></u>	Project 64NATO	Page 14 of 22 Pages					Ë	hibit R	Exhibit R-2 (PE 0603790F)	303790	F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2	Exhibi	t)		DATE	Febi	February 2000	
98 <b>7</b>	BUDGET ACTIVITY	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	⊓E TO Coc	perative R	&D			PROJECT <b>64NATO</b>	:ст <b>АТО</b>
9	F. Schedule Profile Continued	EY 1999	-	EY 2000		4	-	EY 2001	4
9	Agreement signed	ņ	<del>-</del>	۰ ۲		r	-		r
<u> </u>	Calibration review Preliminary data base			×		××		×	
3	Verification of calibration							×	×
9	Final unified data base								×
99	Air C31 Capabilities Project A oreement Signed			×					
3	Draft program and implementation plan			×	~				
3	Contract change request released		×						
9	Issue technical task descriptive			×					
9	Program definition			×					
9	Scope work effort to achieve shared data environment					×			
9	Develop translator extensions						×		×
<u> </u>	US/NATO Battle Lab verification and development test  Examine US/NATO Concent of Onerations						××		
3	CC3DE Project								
3	Agreement Signed			×	<b>~</b>				
9	Testbed Setup & Evaluation		×		<b>~</b>				
3	Network management integration		×						×
3	C3I application & integration demonstration						×		
9	ATLANTIC PAW Project								
9	Radio development	*							
5	Compliance testing		*						
9	Agreement Review/mods signed			^	×				
9	Tool characterization					×			
9	Interpreter characterization/design							×	
99	Allied waveform coding Observations and Modeling for Space Weather Project								×
		Page 15 of 22 Pages				Ш	Exhibit F	Exhibit R-2 (PE 0603790F	90F)

	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)	hibit)		DATE		February 2000	000	
3 <b>8</b>	вирсет астіліту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATO	Coope	Cooperative R&D				PROJECT 64NATO	7. 70
<u>(</u> 2)	F. Schedule Profile Continued	FY 1999	-	$\frac{\text{EY}\ 2000}{3}$		-	EY 2001	π <sup>*</sup>	_
99	Agreement signed Exchange existing data		<b>-</b>		r	- × ×	1	n	t
999	Analyze existing data Test and ungrade models					<b>(</b>	×	×	
<u>e</u>	Support on-orbit operations of IOX					×		<b>*</b>	
99	Analysis on satellite data Scintillation Impacts on Communication and Navigation Systems						×		
	Project								
3	Agreement Signed			×					
9	Implement real-time data collection at existing sites					×			
9	Deploy scintillation monitors				×				
<u> </u>	Correlate and calibrate data sets						×		
3	Characterize local disturbance climatology								×
99	Campaign/complete data collection Develon regional forecast alcorithms							×	×
3	Report on regional scintillation and tailored products for C31 systems								×
9	Refraction and Propagation Modeling for Microwave Systems Project								
9	Test parabolic propagation model with real refraction data					×	;		
<u> </u>	Aircraft measurements: validate extreme refraction cases  Aircraft data reduction and analyses					×	× ×	<b>&gt;</b>	
3	Validation propagation model for extreme cases					<b>(</b>		<b>:</b> ×	
3	Demonstrate model use with AWACS operation								×
9	Final report								×
<u>S</u>	Engine Component Life Extension Project								
5	Agreement signed			×					
96	Engine Rotor Life Extension (ERLE) technical/economic studies  * Advance life prediction methodologies for FRI F	*		×					<b>×</b>
33	Advanced Nondestructive Inspection/Evaluation technology			×					×
	Project 64NATO Page 1	Page 16 of 22 Pages				Exhibit	Exhibit R-2 (PE 0603790F)	60379	0F)

L_	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)		DATE	Febru	February 2000	
90 <b>9</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	ive R&D			PR <b>64</b>	PROJECT 64NATO
(D)	E. Schedule Profile Continued	FX 1999 E	EY 2000 2 3	4		EY 2001 2 3	4
<u> </u>	development Advance manufacture concepts/technical development for ERLE Flight Test Demo of Mini Munitions Release From Internal Weapons Bay Agreement signed Logistics preparations Weapons hardware integration Operational hardware installation Flight test Final Reporting DMT & VAE Technologies Project Agreement signed Program start F-18 Software Conversion Software rehost Visual research Multiship network/constructive forces/coalition DMT R&D	imes	×	×	×	× ×××× × × ×	$\times$ $\times$ $\times$ $\times$
ļ.i.a	Project 64NATO Page	Page 17 of 22 Pages		Щ	thibit R-	Exhibit R-2 (PE 0603790F)	3790F)

	RDT&E PROGRAM ELEMENT/PROJECT	CT COST BREAKDOWN (R-3)	(2-3)	DATE February 2000	, 2000
BUDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATO Cooperative R&D	rative R&D		PROJECT <b>64NATO</b>
<b>(5)</b>	A. Project Cost Breakdown (\$ in Thousands)		0001 283	0000 234	1000 XII
d P	Decore of the Imagination on (21 Syntame		195	213	200
) E	Effects of the follosphere on Cot Systems  FPCT/HFG Project		106	001	0
96	DMCPW		1,000	0	0
3	ive Research and Development Efforts in Ima	ging Spectrometer Development	250	0	0
3	MMCs for Aerospace Applications		100	0	0
3	Geoscience Space Mission/Cooperative Space Measurements		0	75	0
9	Project Refractive Turbulence		105	0	0
9	Advanced Combustor Chamber Concepts Program		0	334	0
9	ITAC Program		200	009	400
9	Anthropometric Accommodation in Crew Systems		300	300	300
3	Aging Aircraft Life Prediction/Extension		0	400	0
9	Structural Integrity of Aging Aircraft		0	350	0
3	Airworthiness of Aging Aircraft		0	250	0
9	Advanced Hybrid Propulsion Technologies Cooperative Research Project	ject	200	0	0
3	ACES II - Ejection Seat Cooperative Modification Project		1,000	0	0
9	Air C3I Capabilities		0	250	351
<u> </u>	CC3DE		0	250	200
9	ATLANTIC PAW		0	250	850
9	Observations and Modeling for Space Weather		0	0	859
9	Space Radiation Sensors		0	100	200
9	DMT Technologies		0	250	200
9	Refraction and Propagation Modeling for Microwave Systems		0	0	200
9	Engine Component Life Extension		0	0	400
9	Effects of Ionization on Hydrocarbon-Air Combustion		0	0	400
3	Scintillation Impacts on Communication and Navigation Systems		0	300	300
9	DMT and VAE Technologies		0	0	250
9	Flight Test Demonstration of Miniature Munitions Release from Internal Bay	nal Bay	0	200	0
9	Total		3,956	4,222	5,509
	Complete information regarding the use of NATO Cooperative R&D funds is not available for all proposed agreements, since some are still being negotiated or were	funds is not available for all proposed agre	eements, since some	e are still being negot	iated or were
۵	Project 64NATO	Page 18 of 22 Pages		Exhibit R-3 (F	Exhibit R-3 (PE 0603790F)

	RDT&E PROGRAM ELEMENT	RAM ELE	MENT/PR	I/PROJECT COST BREAKDOWN (R-3)	ST BF	REAKDOV	VN (R-3)		DATE Fe	February 2000	00
<u>8</u> 8	BUDGET ACTIVITY  04 - Demonstration and Validation	alidation			PE NUMBER AN <b>0603790F</b>		ID TITLE  NATO Cooperative R&D	ve R&D	;	9	PROJECT 64NATO
<b>(3)</b>	A. Project Cost Breakdown (\$ in Thousands) Continued	(\$ in Thousand	ls) Continued			-	FY 1999	666	FY 2000	0	FY 2001
	recently signed. In addition, information on the use of future funding for continuing agreeements is not available in all instances because the funds are used as needed to supplement a project office's related 6.1 through 6.5 RDT&E appropriations.	nformation on t	he use of future igh 6.5 RDT&E	funding for cont appropriations.	inuing agre	seements is not	available in a	ll instances be	scause the fur	ids are used as	needed to
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannin	g Information	(S in Thousands	a						
9	Performing Organizations:	Contract									
	Government	Method/Type	Award or	Performing	Project			e e	,	7,71	F
	<u>Performing</u> Activity	or Funding Vehicle	<u>Obligation</u> Date	Activity EAC	Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	FY 2001	Sudget to Complete	Lotal Program
	Development Organiz	zations									
	Lockheed Martin Colorado	CPAF	Oct 95			0	0	250	301		551
	Springs, CO					,	•	6			,
		CPFF	Apr 98			009	300	300	300 °		1,500
	Boston College Boston, MA	CFSR	Mar 97			155	0	0	0 ;		155
	RADEX Bedford, MA	CPFF	Mar 97			385	75	55	<u>50</u>		565
	Pacific Sierra Research Santa CPFF	CPFF	Mar 97			09	0	0	0		09
	Monica, CA						;	;	•		0
	CPI Fairfax, VA	CPFF	Mar 97			160	20	20	$\frac{20}{\bar{c}}$		220
	U of Massachusetts Lowell,	S,	Apr 97			120	20	20	20		270
	MA						,	!	į		
	Consultants Brookline,	CPFF	Mar 97			220	0	25	20		597
	MA	i d				00	C	05	90		180
	NW Research Associates	Crrr	Apr 9/			20	•	8	2		
	Bellevue, wA	CDEE	May 07			25	O	C	C		25
	O OI 1 Exas Austili, 1A	CPEE	May 07			8	25	· C	0		105
	Applied Research Lab, C of Texas Austin TX		iv (pro				ì	•			
	Lockheed Martin Orlando, FL CPFF	CPFF	Sep 96			913	535	0	0		1,448
	Raytheon TI Systems	CPFF	Dec 97			683	0	0	0		683
	Project 64NATO			Page	Page 19 of 22 Pages	ıges			Exhib	Exhibit R-3 (PE 0603790F)	03790F)

RDT&E PROGRAM ELEMEN	IENT/PROJECT COST	ST BREAKDOWN (R-3)	V (R-3)		DATE February 2000	2000
BUDGET ACTIVITY  04 - Demonstration and Validation	0	PE NUMBER AND TITLE 0603790F NATO Co	ID TITLE NATO Cooperative R&D	R&D		PROJECT <b>64NATO</b>
(U) Performing Organizations Continued:						
Product Development Organizations						
Boeing Seattle, WA CPFF Se	Sep 98	260	200	200	360	1,320
UES, Inc Dayton, OH CPFF O	Oct 97	100	100	0	0	200
NOAA/ATDD Oak Ridge, MIPR O	Oct 97	0	80	0	0	80
					•	3
hitney West Palm CPFF	36 unf	1,000	0	334	0	1,334
Beach, FL						
TBD	TBD	0	0	0	400	400
Boeing Long Beach, CA CPFF Ju	Jul 98	265	0	0	0	265
	Mar 98	200	0	0	0	200
CPFF	Oct 98	325	0	200	0	525
CA CPFF	Oct 98	20	0	0	0	50
I CPFF	Feb 98	50	0	300	0	350
CPFF	Mar 00	0	0	250	0	250
arolina CPFF	Apr 00	0	0	250	0	250
CPIF	Apr 99	0	1,000	0	0	1,000
, MD CPFF	Nov 97	0	700	0	0	700
	Jul 97	0	0	250	750	1,000
CPI Annandale, VA CPFF TI	TBD	0	0	0	200	200
CPFF	TBD	0	0	0	100	100
Boston College Newton, MA CPFF TI	TBD	0	0	0	50	50
Radex CPFF Fe	Feb 01	0	0	0	150	150
Applied Physics Lab Laurel, MIPR M	May 00	0	0	0	158	158
MD						
on, MA CPFF	TBD	0	0	40	40	80
CPFF	TBD	0	0	06	06	180
	TBD	0	0	45	45	06
WA CPFF	TBD	0	0	09	99	125
ark, CA CPFF	TBD	0	0	40	40	80
AFRL Rome, NY TBD TI	ТВО	0	0	200	1,350	1,850
Project 64NATO	Page 20 o	Page 20 of 22 Pages			Exhibit R-3 (PE 0603790F)	.0603790F)

	RDT&E PROGRAM ELEMENT	MENT/PROJECT	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	00
<sup>8</sup> <b>6</b>	BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603790F NATO C	Cooperative R&D	/e R&D		ě ě	PROJECT 64NATO
<u>(</u>	Performing Organizations Continued: Product Development Organizations							
	AFRL Hanscom, MA TBD	TBD	0	0	100	400		200
	Support and Management Organizations AFRL Hanscom, MA		110	50	113	80		353
	AFRL WPAFB, OH		5	0	20	400		425
	45th Space Wing Patrick AF 185	May 95	5	0	0	0		3
	AFRL Eglin AFB, FL		50	17	0	0		19
	Pender Technology, TN CR	Oct 97	45	45	0	0		06
	Veridian Dayton, OH		145	0	80	40		265
	Test and Evaluation Organizations	Tan 08	75	877	c	c		503
	Center. FL.	Jan 70	5	<b>F</b>	>	>		700
	Sverdrup Technology, Inc TN CPAF	Sep 95	1,238	311	100	0		1,649
	Naval Air Warfare MIPR	Jan 99	40	0	0	0		40
	CA.							
	Arnold Engineering TBD	TBD	0	0	200	0		200
	Development Center, TN						•	
	*Not applicable. NATO Cooperative K&D funds supplement as needed a project office's 6.1 through 6.5 KD1&E appropriations for initiating international cooperative R&D agreements and exploiting favorable program and technological opportunities with major allied partners.	unds supplement as needed a ogram and technological opp	a project office's 6.1 through 6 portunities with major allied pai	S KUT&E app rtners.	ropriations to	or initiating i	international co	operative
9	Government Furnished Property:   Contract   Method/Tyne	Award or						
		_	Total Prior	Budget	Budget	Budget	Budget to	Total
	Product Development Property	Date	1998 T. 1998	EY 1992	F I 2000	FY 2001	<u>Somplere</u>	rogram
	Support and Management Property None							
	Project 64NATO	P	Page 21 of 22 Pages			Exhibi	Exhibit R-3 (PE 0603790F)	)3790F)

RDT&E PROGRAM ELEMENT/PROJECT	//PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE Fet	February 2000	
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603790F NATO	NATO Cooperative R&D	R&D		PR <b>6</b> 4	PROJECT 64NATO
(U) Government Furnished Property Continued:  Test and Evaluation Property Fora laser system PO Nov 97 Jan 98  Subtotals Subtotals Subtotal Support and Management	147  Total Prior to FY 1999 5,731 360	0 Budget ] EY 1999 FY 3,085 112	0 Budget EY 2000 3,709 213	0 Budget EY 2001 4,989 520	0 <u>Budget to</u> Complete	147 Total Program 17,514 1,205
Subtotal Test and Evaluation  Total Project	1,479	3,956	300 4,222	5,509	0 0	2,538
Project 64NATO	Page 22 of 22 Pages		; ;	Exhibit	Exhibit R-3 (PE 0603790F)	3790F)

	RDT8	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
8UDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation	and Validation			PE NUMBER AND TITLE 0603800F Joint	RAND TITLE	ום τιτιΕ Joint Strike Fighter	ghter			PROJECT <b>642025</b>
	COST (\$ i	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642025	5 Joint Strike Fighter (JSF)	(JSF)	453,600	249,088	129,538	0	0	0	0	0	1,695,723
	Quantity of RDT&E Articles	Articles	0	0	0	0	0	0	0	0	0
5	A. Mission Description The Joint Strike Fighter and allies. Current prog technologies and concep service. Navy and Air F phase of the program an	A. Mission Description  The Joint Strike Fighter (JSF) Program will develop and field an affordable, highly common family of next generation strike fighter aircraft for the USN, USMC, USAF and allies. Current program emphasis is on facilitating the evolution of fully validated and affordable joint operational requirements, and demonstrating cost leveraging technologies and concepts to lower risk prior to entering Engineering and Manufacturing Demonstration (EMD) in FY 2001. This is a joint program with no executive service. Navy and Air Force each provide approximately equal shares of annual funding for the program. The United Kingdom (UK) is a collaborative partner in this phase of the program and several other countries also participate.	and field an ang the evolution Braineer ing Engineer tely equal sh	offordable, I fon of fully ing and Ma lares of ann	nighly comm validated an mufacturing ual funding 1	on family of a affordable Demonstrati or the progr	next genera joint operati on (EMD) in am. The Un	ation strike fional require n FY 2001.	ighter aircra ments, and ( This is a join om (UK) is a	ft for the US demonstratin nt program v collaborativ	N, USMC, USAF g cost leveraging ith no executive e partner in this
	'FY 1999 ACTUAL' UNI PROGRAM AMOUNTS	FY 1999 ACTUAL' UNDERSTATED BY \$2.537M. PROGRAM AMOUNTS.	BTR NOT	REFLECTI	ED IN ABID	ES DATAB	ASE. COST	BREAKOU	JT BELOW	BTR NOT REFLECTED IN ABIDES DATABASE. COST BREAKOUT BELOW REFLECTS CORRECT	CORRECT
	PROGRAM FUNDING BREAKOUT (CANADA, AND ITALY(FY99 ONLY)	PROGRAM FUNDING BREAKOUT (FY1999, 2000, 2001) REFLECTS NAVY, AIR FORCE, MULTI-LATERAL (NETHERLANDS, NORWAY, & DENMARK), CANADA, AND ITALY(FY99 ONLY).	00, 2001) RE	FLECTS N	AVY, AIR I	ORCE, MU	LTI-LATEI	RAL (NETE	IERLANDS	, NORWAY	, & DENMARK),
99	FY 1999 (\$ in Thousands) \$762,415 Cor	ands)  Continued Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney including company unique technology demonstrations, completed final design and continued build of Concept Demonstrator Aircraft (CDA) and continued concept refinement for a	ation efforts l al design and	by Boeing, I continued	Lockheed M build of Cor	artin and Pra cept Demor	tt & Whitne Istrator Airco	ey including raft (CDA) a	company ur ınd continue	nque technol d concept re	ogy finement for a
99	\$40,153 \$141,580	tri-service family of aircraft.  Continued the Alternate Engine Program.  Continued technology maturation demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility, propulsion and mission systems. Completed approximately half of the demonstrations. Continued systems engineering support for the Concept Demonstration Phase (CDP) in the areas of system test, air vehicle analysis and integration, advanced cost estimating, survivability, integrated flight and propulsion control and carrier suitability.	te Program.  ion demonsti  s. Complete  the areas of	rations and d approxim system tesi	assessments ately half of t, air vehicle	in the areas the demonst analysis and	of airframe, rations. Cor I integration	flight syster ntinued syste , advanced c	ns, manufac ems enginee ost estimatii	turing and pr ring support ng, survivabi	oducibility, for the Concept lity, integrated
(D)	(U) \$9,341	Continued technology maturation demonstrations and assessments in the area of Prognostics and Health Management, supportability and	ion demonst	rations and	assessments	in the area o	f Prognostic	s and Healtl	h Manageme	ent, supportal	bility and
<u>(G</u>	(U) \$13,307	training.  Continued modeling and simulation activities to support strike warfare mission area analysis and requirements analysis efforts including COPT	lation activit	ies to suppo	rt strike war	fare mission	area analysi	is and requir	ements anal	ysis efforts i	ncluding COPT
P	Project 642025			Page	Page 1 of 12 Pages	Š				Exhibit R-2	Exhibit R-2 (PE 0603800F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
BUDG <b>04 -</b>	BUDGET ACTIVITY		PE NUMBER AND TITLE 0603800F Joint Strike Fighter	PROJECT <b>642025</b>
(0)	A. Mission Description Continued	ion Continued		
<u>5</u>	FY 1999 (\$ in Thousands) Continued to facilitate the modeling and securisition)	ands) Continued to facilitate the Services' joint requirements definition. Continued requirements analysis in support of final requirements document. Continued modeling and simulation support testing, training, and refinement of concept of operations for the weapons system (simulation based	luirements analysis in support of final rec	quirements document. Continued stem (simulation based
99	\$15,227 \$982,023	Continued mission support, including program office functions.  Total		
99	EY 2000 (\$ in Thousands) \$394,892 Cor tech	ands)  Continue Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney including ground and flight demonstrations, areas of technology maturation, and concept refinement for a tri-service family of aircraft. Request proposals from contractors for their designs and EMD	$\mathfrak a$ and Pratt & Whitney including ground $\mathfrak y$ of aircraft. Request proposals from cor	and flight demonstrations, areas of ntractors for their designs and EMD
99	\$26,190 \$68,554	the Alternate Engine Prechnology maturation of and mission systems.	rogram. demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility, Continue systems engineering support for the Concept Demonstration Phase in the areas of system test, air advanced cost estimating, survivability, integrated flight and propulsion control, and carrier suitability.	ufacturing and producibility, in the areas of system test, air of and carrier suitability.
9	\$8,853		demonstrations and assessments in the area autonomic logistics (formerly supportability and training) Management technology maturation demonstrations and assessments	pportability and training).
9	\$9,030	Continue modeling and simulation activities to support strike warfare mission area analysis and requirements analysis efforts including COPT to facilitate the Services' joint requirements definition. Support analysis as required for final Operational Requirements Document (ORD) coordination and signature. Continue modeling and simulation support testing, training, and refinement of concept of operations for the weapons system (simulation based acquisition).	mission area analysis and requirements as required for final Operational Requir	analysis efforts including COPT to ements Document (ORD) ncept of operations for the weapons
99	\$15,377 \$522,896	Continue mission support, including program office functions. Total		
99	FY 2001 (\$ in Thousands) \$110,552 Cor	ands)  Complete Concept Demonstration efforts by Boeing, Lockheed Martin and Pratt & Whitney including ground and flight demonstrations, areas of	n and Pratt & Whitney including ground	and flight demonstrations, areas of
<u>(</u>	\$94,000	complete the Alternate Engine Phase IIIA effort (Common Core Design Trade Studies) in this P Develonment Program will continue in ISF EMD Program Flements 0604800N and 0604800F)	Copi I criticalisati for a ur-service famility of ancidar.  Phase IIIA effort (Common Core Design Trade Studies) in this Program Element. (Alternate Engine in ISF EMD. Program Elements 0604800N and 0604800F.)	ent. (Alternate Engine
5	\$38,137	Complete technology maturation demonstrations and assessments in the areas of airframe, flight systems, manufacturing and producibility,	he areas of airframe, flight systems, man	ufacturing and producibility,
ď	Project 642025	Page 2 of 12 Pages		Exhibit R-2 (PE 0603800F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	ATION SHEET (R-2 Exhib	oit)	DATE <b>Febr</b>	February 2000
80 <b>4</b>	вирдет астилту 04 - Demonstration and Validation	and Validation	PE NUMBER AND TITLE 0603800F Joint Strike Fighter	ke Fighter		PROJECT <b>642025</b>
9	A. Mission Description Continued	on Continued				
9	FY 2001 (\$ in Thousands) Continued mission exetern	se propulsion and	autonomic logistics. Complete systems engineering sumort for the Concept Demonstration Phase in the areas	a sumport for the C	oncent Demonstration	Dhace in the areas
			gration, advanced cost estimating, surviver Milestone II. Commence and complete	s support for the challity, integrated fl source selection ev	light and propulsion c	control and carrier set for final design.
5	\$5,000	Complete modeling and simulation activities to support Milestone II analyses. Complete modeling and simulation support testing, training, and refinement of concept of operations for the weapons system (simulation based acquisition)	ies to support Milestone II analyses. Con weapons system (simulation based acquii	nplete modeling and sition)	d simulation support t	esting, training, and
99	\$15,715 \$263,404	Complete mission support, including program office functions.  Total	am office functions.			
9	B. Budget Activity Justification This program is funded under Pro test related to specific ship or airc	B. Budget Activity Justification This program is funded under Program Definition and Risk Reduction (PDRR), formerly Demonstration and Validation (DEM/VAL), because it integrates hardware for test related to specific ship or aircraft applications.	ction (PDRR), formerly Demonstration an	ıd Validation (DEM	4/VAL), because it in	tegrates hardware for
9	C. Program Change	C. Program Change Summary (\$ in Thousands)				
Ĺ	Prestions President's	Prestions President's Budget (FV 2000 DRP)	EY 1999	735 374	FY 2001	Total Cost
33	Appropriated Value		456,137	250,374	0,0,7,7	1,7,7,001
9	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research	opriated Value teral Reductions tovative Research				
	c. Omnibus or Other Above Thr d. Below Threshold Reprogram	c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram	3.825			
	e. Rescissions f Other		-3,825	-1,286		
99	Adjustments to Budget Years Since Facurent Budget Submit/FY 2001 PBR	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR	456,137	249,088	106,980 129,538	122,042 1,695,723
<u>п</u>	Project 642025		Page 3 of 12 Pages		Exhibit R	Exhibit R-2 (PE 0603800F)

	RDT&E BUDGET ITEM JU	TEM JUSTI	FICATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Exhi	ibit)	ď	DATE February 2000	y 2000
BUD( <b>04</b> -	вирсет астилту 04 - Demonstration and Validation			PE NUMBER AND TITLE 0603800F Joint	AND TITLE F Joint St	PE NUMBER AND TITLE O603800F Joint Strike Fighter	<u>, , , , , , , , , , , , , , , , , , , </u>		PROJECT <b>642025</b>
(£)	C. Program Change Summary (\$ in Thousands) Continued	ousands) Continu	eq.						
<b>5</b>	Significant Program Changes:  (U) Significant Program Changes: FY99 increase of \$3,825 reflects Below Threshold Reprogramming to mitigate impacts caused by the Economic Assumption Congressional Recission (\$1,286 reflects the across the board Congressional Recission (\$1,286 reflects the across the board Congressional Recission. FY00 Appropriated Value increase of \$15M reflects Congressional increase for the alternate engine program. FY01 increase reflects a Zero Base Transfer from PE0604800F of \$107 million to cover alternate engine program and CDP requirements and a program adjustment decrease of \$20.	increase of \$3,82. ie 'Inflation Saving rease of \$15M ref er alternate engine	5 reflects Belov is' Congression: lects Congressi program and C	w Threshold Real Recission (\$ional increase f	programming 2,537). FY00 or the alternate his and a programs and a program and a program and a programs and a program and a progra	to mitigate imj decrease of \$1 engine progra am adjustment	pacts caused by 286 reflects them. FY01 inc.	y the Economic As he across the board rease reflects a Zel 20.	ssumption 1 Congressional ro Base Transfer
9	D. Other Program Funding Summary (\$ in Thousands)	in Thousands)							
,	FY 1999 Actual	PS FY 2000 Estimate	EY 2001 Fistimate	EX 2002 Estimate	EY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to	Total Cost
9	RDT&E 0603800N 471,290		131,566	0	0	0	0	0	1,742,506
3	RDT&E 0603800E	0 0	0	0	0	0	0	0	118,006
3	United Kingdom 34,096	•	0	0	0	0	0	0	200,291
3	Multi-Lateral (see Note1) 7,500		1,700	0	0	0	0	0	32,100
9	Canada 3,000		009	0	0	0	0	0	10,600
3	Italy 10,000	0							10,000
9	RDT&E 0604800F	0 0	299,540	1,321,726	1,927,241	1,853,319	1,631,937	Continuing	TBD
9	RDT&E 0604800N	0 0	295,962	1,324,048	1,932,487	1,859,938	1,639,111	Continuing	TBD
3	Related Procurement								
	Funding:								
9	nt 0207142F - JSF	0 0	0	0	0	18,000	587,308	Continuing	TBD
ŧ			Ć	Ċ	¢	ć	i c		
€	Procurement 0204800N - JSF Squadrons	0	0	•	•	0	57,75	Continuing	IBD
	Note 1: Multi-Lateral countries include Netherlands, Norway, and Denmark.	therlands, Norway	, and Denmark	. ,					
	Note 2: This is a joint program with no executive service. The UK is a collaborative partner in this phase of the program. Several other countries participate.	cutive service. The	re UK is a colla	sborative partne	r in this phase	of the progran	n. Several oth	er countries partic	ipate.
	Note 3: Milestone II for EMD of the JSF is planned in FY 2001	planned in FY 20	.01.						
	Note 4: RDT&E 0604800 depicted funding excludes anticipated foreign funding which is TBD.	g excludes anticipa	ted foreign fun	ding which is 7	rbd.				
	Note 5: December 1998 Selected Acquisition Report (SAR) reflected total EMD cost estimate of \$19.8B (\$TY) funded by the USN, USAF, and anticipated (but not	on Report (SAR) 1	reflected total E	EMD cost estim	ate of \$19.8B	(\$TY) funded	by the USN, U	JSAF, and anticipa	ted (but not
	innalized) foreign sources. Note 6: Advanced procurement for JSF is planned in FY 2004.	planned in FY 200	4						
				20 4 of 10 Dags	,				E-rihit B 2 / BE 0603800E)
_	Project 642025		raś	rage 4 or 12 rages	S			EXPIDIT R-2 (F	'E Ubusauur)

RDT&E BUDGET ITEM JUSTIFICATION S	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000
BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
04 - Demonstration and Validation	1603800F Joint Strike Fighter	642025

Program activities center around three distinct objectives that provide a sound foundation for the start of Engineering and Manufacturing Development (EMD) in 2001:

- (1) facilitating the Services' development of fully validated, affordable operational requirements;
- (2) lowering risk by investing in and demonstrating key leveraging technologies that lower the cost of development, production and ownership; and
  - (3) demonstrating operational concepts.

unprecedented degree, the JSF program is using cost-performance trades early, as an integral part of the weapon system development process. The Services are defining Services continue to refine their requirements through this process which will culminate in the Operational Requirements Document (ORD) in FY 2000 to support the requirements through an iterative process, balancing weapon system capability against life cycle cost at every stage. Each iteration of the requirements is provided to industry. They evolve their designs and provide cost data back to the warfighters. The warfighters evaluate trades and make decisions for the next iteration. This process produced the Services' first Joint Initial Requirements Document (JIRD I) in 1995 and the second and third iterations in 1997 and 1998, respectively. The Early warfighter and technologist interaction is an essential aspect of the requirements definition process, and key to achieving JSF affordability goals. To an Milestone II decision.

is on technologies which have been identified as high payoff contributors to affordability, supportability, survivability and lethality. Numerous demonstrations have been A sizable technology maturation effort is underway to reduce risk and life cycle cost (LCC) through technology maturation and demonstration. The primary emphasis accomplished and others are in process to validate performance and life cycle cost impact to component, subsystem and the total system.

continue refinement of their ultimate delivered weapon system concepts. Specifically, Boeing and Lockheed Martin will demonstrate commonality and modularity, Short propulsion hardware and engineering support for both Boeing's and Lockheed Martin's on-going JSF Concept Demonstration efforts. The JSF Concept Demonstration Take Off/ Vertical Land (STOVL) hover and transition, and low speed handling qualities of their respective weapon system concepts. Pratt and Whitney is providing Concept Demonstration Programs. These competing contractors will build and fly concept demonstrator aircraft, conduct concept unique ground demonstrations, and A multi-year \$2.2 billion JSF Concept Demonstration effort commenced in November 1996 with competitive contract awards to Boeing and Lockheed Martin for approach has several benefits:

- (1) Maintains the competitive environment prior to EMD and provides for two different STOVL approaches and two different aerodynamic configurations.
  - (2) Demonstrates the viability of a multi-service family of variants with high commonality and modularity between CTOL, CV and STOVL variants.
    - (3) Provides affordable and low risk technology transition to the JSF EMD phase.

The JSF Alternate Engine Program, with General Electric, continues development of an alternate engine for production.

Downselect to a single prime weapon system contractor for EMD and Milestone II are planned in FY 2001. JSF production is planned to begin in FY 2005.

Project 642025

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Exhibit R-2 (PE 0603800F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R	-2 Exhib	it)	DATE	Febru	February 2000	
BUDC <b>04</b> -	вирсет астіvіту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603800F Joint Strike Fighter	р тіт∟Е <b>Joint Stril</b>	ce Fighter			PROJECT <b>642025</b>	ЕСТ <b>025</b>
(D)	F. Schedule Profile	X 199	•	X 200			X 200	,
999	Commenced Concept Development Phase: Dec 94 Released RFP for Concept Demonstration Efforts: Mar 96 Designated a joint, DoD, Acq Category ID Program by USD(A&T):	2	4	2	4	-	<b>7</b>	4
5	May 90 Competitively awarded CDP Contracts to Boeing and Lockheed Martin: Nov. 96							
9	Complete Operational Requirements Document (ORD) Approval: Mar 00			×				
<u>(3</u>							×	
	Project 642025	Page 6 of 12 Pages			Ä	chibit R-	Exhibit R-2 (PE 0603800F)	300F)

	RDT&E PROGRAM ELEMENT	M ELEM		/PROJECT COST BREAKDOWN (R-3)	ST BF	REAKDOV	VN (R-3)		DATE <b>Fe</b>	February 2000	o
80DX <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	Jation			PE NUMBER AN <b>0603800F</b>		ND TITLE Joint Strike Fighter	ter		PR <b>64</b>	РКОЈЕСТ <b>642025</b>
9	A. Project Cost Breakdown (\$ in Thousands)	1 Thousands)					FV 1000	000	FV 2000		FV 2001
9	PROJECT COST CATEGORIES:							3	777	21	
3	WEAPON SYSTEMS CONCEPT DEMONSTRATIONS (including flying demonstrators and supporting aroundsion efforts)	[ DEMONSTR	ATIONS (ir	ncluding flying de	emonstrato	rs and	762,415	15	394,892	2	110,552
99	SUPPORTING PROPRISON SUPPORTING SUPPORTING PROGRAM TECHNOLOGY MATTIRATION APPAS.	AM TARFAS:					40,153	53	26,190	C	94,000
3	Airframe	A TAINET NO.					1,231	31	1,420	0	1,500
3	Flight Systems						32,589	689	899'9	8	3,320
3	Manufacturing and Producibility	ty					3,6	3,675	1,233	3	1,530
9	Propulsion						24,282	:82	7,245	2	3,000
9	Mission Systems						41,675	575 56	9,522	, 2	9,955
9	Systems Engineering Support	* * * * * * *	-				37,208	208	41,546	9	10,468
3	Prognostics and Health Management/Autonomic Logistics Modeling, Simulation, Analysis, Threat, COPT and Core Support	ement/Autonolis, Threat, COl	mic Logistic.	s Support			12,907	111	8,630	<b>1</b> C	4,600
3	Mission Support			4			5,7	5,709	5,972	2	6,210
5	SUPPORT (CS)	•					10,868	898	10,725	2	10,825
<u>3</u> 9	TEST AND EVALUATION: (included above) MANAGEMENT: N/A	icluded above)									
3	Total						982,023	123	522,896	9	263,404
9	B. Budget Acquisition History and Planning Inform	nd Planning I	nformation	ation (\$ in Thousands)	æ						
9	Organizations: I			«							
	Covernment Performing or E Activity	Method/Lype Avor Eunding Obvehicle Da	Award or Obligation Date	Performing Activity EAC	Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
۵	Project 642025			Page	Page 7 of 12 Pages	ges			Exhibi	Exhibit R-3 (PE 0603800F)	3800F)

RDT&E PROGRAM ELEMEN	SRAM EL		I/PROJECT C	COST BR	EAKDO	BREAKDOWN (R-3)		DATE Februs	February 2000
вирбет АСТІVITY <b>04 - Demonstration and Validation</b>	/alidation			PE NUMBER AT <b>0603800F</b>		iD TITLE Joint Strike Fighter	ter		PROJECT <b>642025</b>
(U) <u>Performing Organizations Continued:</u> <u>Product Development Organizations</u> Strike Warfare Concept	Continued: izations								
Studies: Miscellaneous Technology Maturation	Various		11,467	11,467	11,467				11,467
Concept Exploration Phase: Filed Activities Strike Warfare Systems	Various		3,432	3,432	3,432				3,432
Design Development. Boeing, Seattle WA C/CPFF McAir, St Louis MO C/CPFF Northrop, Pico Rivera CA C/CPFF	C/CPFF C/CPFF C/CPFF		32,770 23,708 21,358	32,770 23,708 21,358	32,770 23,708 21,358				32,770 23,708 21,358
Lockheed Martin, Fort Worth TX Miscellaneous Field Activities	C/CPFF Various Various		28,311 1,121 8,322	28,311 1,121 8,322	28,311 1,121 8,322				28,311 1,121 8,322
ASTOVL: Lockheed Martin Boeing Miscellaneous	SS/CPFF SS/CPFF Various		16,416 11,200 15,539	16,416 11,200 15,539	16,416 11,200 15,539				16,416 11,200 15,539
Core Team Support Field Activities Weapon System Concept Demonstrations(Note 1):	Various		2,522	2,522	2,522				2,522
Boeing I ookheed Martin	C/CPFF	Oct 98/99/00 Oct	734,013	734,013	291,356	269,627	156,761	16,269	734,013
Pratt & Whitney, WP Beach, FL	SS/CPFF	98/99/00 0/66/86 0	914,471	914,471	537,405	212,666	84,200	80,200	914,471
Project 642025			Pag	Page 8 of 12 Pages	es			Exhibit R-3	Exhibit R-3 (PE 0603800F)

RDT&E PROGRAM ELEMEN	SRAM ELI		I/PROJECT C	COST BREAKDOWN (R-3)	EAKDOW	VN (R-3)		DATE February 2000	ry 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	Validation			PE NUMBER AND TITLE 0603800F Joint		וס זוד∟ב Joint Strike Fighter	ter		PROJECT <b>642025</b>
(U) Performing Organizations Continued: Product Development Organizations Alternate Engine Program	Continued: izations								
(Note 2): General Electric, Cincinnati OH	SS/CPFF		7,000	7,000	7,000				7,000
General Electric, Cincinnati OH TECHNOLOGY MATURATION AREAS: AIRFRAMF:	SS/CPFF	Nov98/Oct9 9/Oct00	222,137	222,137	61,794	40,153	26,190	94,000	222,137
McAir	SS/CPFF		19,240	19,240	19,240				19,240
Miscellaneous	Varions	Varions	2,168	2,168	1,985	94	44	45	2,168
Field Activities	Various	Nov98/99/0 0	8,204	8,204	4,236	1,137	1,376	1,455	8,204
FLIGHT SYSTEMS:									
Lockheed Martin McAir	C/CPFF C/CPFF	Nov98/99	52,700 65.821	52,700 65.821	41,515	9,807	1,378		52,700
Miscellaneous	Various	Various	10,605	10,605	9,090	650	09	805	10,605
Field Activities	Varinos	Nov98/99/0 0	24,448	24,448	13,491	4,212	4,230	2,515	24,448
MANUFATURING AND PRODUCIBILITY: Hughes, Los Angeles	C/CPFF	,	5,065	5,065	5,065				5,065
Lockheed Martin General Res.	C/CPFF C/CPFF	Nov98/99	10,200	10,200 1,945	7,500 1,945	2,100	009		10,200
Scaled Composites Lockheed Martin Miscellaneous	C/CPFF C/CPFF	Varions	2,000 700 1 679	2,000 700	2,000 700 1.343	201	75	09	2,000 700 1,679
Project 642025			Pag	Page 9 of 12 Pages				Exhibit R-3 (	Exhibit R-3 (PE 0603800F)

RDT&E PROGRAM ELEMENT/PROJECT	GRAM EL	EMENT/PR(		COST BR	BREAKDOWN (R-3)	VN (R-3)		DATE <b>Febru</b> a	February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	Validation			PE NUMBER AND TITLE 0603800F Joint	AND TITLE F Joint S	אס דודרב Joint Strike Fighter	er		PROJECT <b>642025</b>
(U) Performing Organizations Continued: Product Development Organizations	s Continued:								
Field Activities	Various	Nov98/99/0 0	6,688	6,688	3,286	1,374	558	1,470	889'9
PROPULSION:		)							
Pratt & Whitney	C/CPFF		5,448	5,448	5,448				5,448
General Electric	SS/CPFF		5,681	5,681	5,681				5,681
Pratt & Whitney	SS/CPFF		30,000	30,000	30,000				30,000
General Electric	SS/CPFF		3,000	3,000	3,000				3,000
Pratt & Whitney	SS/CPFF	Jan99	26,777	26,777	22,988	3,789			26,777
Pratt & Whitney	SS/CPFF		3,640	3,640	3,640				3,640
Pratt & Whitney	SS/TBD	Dec98	8,200	8,200	7,000	1,200			8,200
NASA Contracts	Various	Jul99	2,800	2,800	700	2,100			2,800
Miscellaneous	Various	Various	14,979	14,979	12,895	1,804	48	50	14,797
Field Activities	Various	Nov98/99/0	50,020	50,020	24,484	15,389	7,197	2,950	50,020
		0							
MISSION SYSTEMS:									
TI, Plano TX	C/CPFF		2,464	2,464	2,464				2,464
Lockheed	SS/CPFF		6,856	6,856	6,856				6,856
McAir	SS/CPFF		6,524	6,524	6,524				6,524
Raytheon	C/CPFF	Nov98/99	45,173	45,173	27,274	17,899	0		45,173
Northrop Grumman	C/CPFF	Nov98/99	41,903	41,903	25,946	15,957	0		41,903
Boeing	C/CPFF		1,575	1,575	1,575				1,575
Lockheed Martin	C/CPFF		1,517	1,517	1,517				1,517
Hughes	C/CPFF		3,681	3,681	3,681				3,681
Classified	Classified	Nov98	3,000	3,000	2,000	1,000			3,000
Miscellaneous	Various	Various	26,092	26,092	20,097	1,467	2,139	2,389	26,092
Field Activities	Various	Nov98/99/0	42,584	42,584	22,283	5,352	7,383	7,566	42,584
		0							
SYSIEMS FNGNEEPING SUBPORT:	Ė								
	:								
Project 642025			Page	Page 10 of 12 Pages	Sa			Exhibit R-3	Exhibit R-3 (PE 0603800F)

RDT&E PROGRAM ELEMEN	GRAM EL	EMENT/PR	T/PROJECT C	COST BR	BREAKDOWN (R-3)	VN (R-3)		DATE <b>Febru</b> a	February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	l Validation			PE NUMBER AND TITLE 0603800F Joint	AND TITLE F Joint S	וס τιτ∟Ε Joint Strike Fighter	ter		PROJECT <b>642025</b>
(U) Performing Organizations Continued:	s Continued:								
Product Development Organizations Miscellaneous Varior	inizations Various	Various	33,706	33,706	11,993	8,573	10,011	3,129	33,706
Field Activities	Various	Nov98/99/0	132,478	132,478	64,969	28,635	31,535	7,339	132,478
div sortsonsoda		<b>-</b>							
HEALTH MANAGEMENT	Į.								
Pratt & Whitney	C/CPFF		10,100	10,100	10,100				10,100
General Electric	C/CPFF	Jan99	1,500	1,500		1,500			1,500
Classined Project 3	C/CPFF		8.576	8.576	7.826	750			8.576
Project 4	C/CPFF		5,549	5,549	4,799	750			5,549
Miscellaneous	Various	Various	11,330	11,330	2,271	2,281	5,661	1,117	11,330
Field Activity	Various	Nov98/99/0	21,226	21,226	7,677	4,030	3,192	6,327	21,226
		0							
MODELING, STATIT ATTON ANALYSIS	<u>8</u> 1								
THREAT, COPT, AND	<b>,</b>								
CORE SUPPORT:									
Miscellaneous	Various	Various	46,719	46,719	37,719	5,033	3,277	690	46,719
Field Activities	various	Nov98/99/0 0	30,145	30,143	19,008	1,8/4	5,533	3,910	50,143
MISSION SUPPORT:		•							
Institue for Defense	Grant		2,500	2,500	2,500				2,500
Analysis			;			1		•	
Field Activities	Various	Varions	38,524	38,524	20,633	5,709	5,972	6,210	38,524
00000			ב	. 11 of 13 Dec	5			ני ם <del>י</del> יִּילִיּלִי	C-bibit D 3 /DE O603800E)
Project 642025			Fag	rage 11 of 12 rages	Se			EXHIDIL R-S	(PE UDUSOUUL)

RDT&E PROGRAM ELEMENT	ELEMENT/PROJEC	/PROJECT COST BREAKDOWN (R-3)	REAKDO!	<b>NN</b> (R-3)		DATE <b>Fe</b>	February 2000	00
BUDGET ACTIVITY  04 - Demonstration and Validation	ion	PE NUMBI 060380	PE NUMBER AND TITLE 0603800F Joint Strike Fighter	trike Figh	ter		9	PROJECT <b>642025</b>
<ul> <li>(U) Performing Organizations Continued: Note 1: <ul> <li>Includes government managed equipment.</li> <li>Consistent with recent Boeing and Lockheed Martin replans, annual funding increments reflect budgeted basic Concept Demonstration Program (CDP) efforts as areas of technology maturation.</li> <li>Pratt and Whitney Total Program reflects award fees totaling \$35.1M, FY 1998 and prior and basic CDP efforts.</li> </ul> </li> </ul>	e <u>d:</u> pment. ockheed Martin replans, annual f	unding increment , FY 1998 and pri	s reflect budget or and basic CI	ted basic Conc	cept Demonstr	ation Prograr	n (CDP) effor	
Note 2: The Target Value includes Propulsion Technology Maturation efforts.  Support and Management Organizations ANSER, Arlinton VA SS/CPFF Jan99/00/01 33,701 Miscellaneous Various Various 32,631 Test and Evaluation Organizations Included Above	opulsion Technology Maturation efors  In Jan99/00/01 33,701  S Various 32,631	efforts. 33,701 31 32,631	19,541	4,720 6,148	4,720	4,720 6,105		33,701
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation			Total Prior to FY 1999 2,006,989 33,914	Budget FY 1999 971,155 10,868	Budget FY 2000 512,171 10,725	Budget FY 2001 252,579 10,825	Budget to Complete	Total Program 3,742,894 66,332
Total Project			2,040,903	982,023	522,896	263,404		3,809,226
Project 642025		Page 12 of 12 Pages	ıges			Exhibi	Exhibit R-3 (PE 0603800F)	03800F)

	RDT&E BUDGET ITEM JU	JSTIFIC	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	February 2000	. 2000
BUDGET ACTIVITY 04 - Demons	BUDGET ACTIVITY			PE NUMBER 0603850	PE NUMBER AND TITLE 0603850F Integr	ated Bro	adcast S	ervice ([	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service (DEM/VAL)	РВОЈЕСТ <b>644778</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644778	644778 Integrated Broadcast Service	0	24,198	24,488	17,146	20,258	10,215	10,452	10,452 Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	-	1	2	2 Continuing	TBD
4	. Oto Choman	Keponocoda ikbii	COCOST							

\* FY 1999 IBS funds (Procurement, RDT&E, O&M) are in USN PE0305972N.

# (U) A. Mission Description

near-real-time, integrated dissemination architecture. IBS consolidates existing intelligence broadcast systems into a common-format, common-terminal, theater-tailored architecture. The IBS design incorporates new functionality in broadcast and information management, a new message format, and a new receiver. It fields five fixed The Integrated Broadcast Service (IBS) provides warfighters with critical and highly perishable intelligence and information in a single, correlated picture via a and two deployable Information Management Elements (IME) to geographic Commanders-in-Chief ( CINC) that perform requirements as set forth in the Joint Operational Requirements Document.

- Accept data from dissimilar, geographically-dispersed data sources including airborne, space-based, shipborne and ground Signals Intelligence (SIGINT), radar and infrared sensors.
- Transmit intelligence and information to end users equipped with Joint Tactical Terminal (JTT) or terminals which incorporate the Common IBS Modules (CIBS-M). - Disseminate theater oriented, based, and focused intelligence and information, based on user generated and CINC validated dissemination priorities.

  - · Disseminate intelligence and information over various communications paths, based on the communications available to the end user.

Intelligence, Surveillance, Reconnaissance & Space and the Chief of Naval Operations/N6B) directed a program restructure, which was a result of a Spiral #1 schedule In July 1999, the IBS Executive Integrated Product Team (IPT) (co-chaired by the Deputy Assistant Secretary of Defense/Command, Control, Communications, slip. Spiral #1 problems were due to a misunderstanding of the complexity of IBS requirements. Program re-plan approval expected February 2000

9	FY 1999 (\$ in Thousands)	
3	) \$0 No Activity under USAF PE	
9	) \$0 Total	

Exhibit R-2 (PE 0603850F) Page 1 of 6 Pages **Project 644778** 

	RDT&E	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)		DATE February 2000	000
8006 <b>04 -</b>	вирсет астилту 04 - Demonstration and Validation	nd Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service (DEM/VAL)	roadcast Servi	ice (DEM/VAL)	РРОЈЕСТ <b>644778</b>
3	A. Mission Description Continued	n Continued				
999	EY 2000 (\$ in Thousands) \$2,123 Ma \$4,913 Sys	Ids)  Maintain a Program Management Office, including program supervision, finance and acquisition strategy execution Systems Engineering, including development of architectures, System of Systems management through the Joint Broadcast Configuration Control Board (JBCCB) and Broadcast Operations Integration Group (BOIG), and Risk Reduction Studies using Simulation Based Acquisition	rogram supervision, finance and acitectures, System of Systems manaitegration Group (BOIG), and Risk	quisition strategy exegement through the J Reduction Studies us	ecution oint Broadcast Configu sing Simulation Based	ation cquisition
9	\$16,180	(SBA) tools.  Design and build Information Management Elements (IMEs). This task area was the major emphasis of the program restructure, resulting in a two phase development of the IMEs and associated IBS dissemination architecture. Phase I (FY 2000) concentrates on the design and	(IMEs). This task area was the man dissemination architecture. Phan	ajor emphasis of the pase I (FY 2000) conce	orogram restructure, resentrates on the design an	ulting in a id
55	\$982 (6	development of the 1DS architecture. Common Message Format (CMF) development Total				
999	FY 2001 (\$ in Thousands) \$2,156 Ma \$2,750 Sys	Maintain a Program Management Office, including program supervision, finance and acquisition strategy execution Systems Engineering, including maintenance of architectures, System of Systems management through the JBCCB and BOIG, and Risk	rogram supervision, finance and acitectures, System of Systems manag	equisition strategy exegement through the J	ecution BCCB and BOIG, and I	isk
9999	\$18,109 \$1,000 \$473 \$24,488	Continue the design and build of Information Management Elements (Phase II)  CMF development  Conduct Development Test & Evaluation  Total	ement Elements (Phase II)			
3	B. Budget Activity Justification This program is in budget activity	4 because it includes	demonstrating and validating the use of technologies to create an operational integrated broadcast service.	o create an operationa	il integrated broadcast s	ervice.
9	C. Program Change 5	C. Program Change Summary (\$ in Thousands)	7 1000	TV 2000	EV 2001	Total Cont
99	Previous President's Budget (FY 2000 PBR) Appropriated Value	ıdget (FY 2000 PBR)	0		24,706	TBD
9	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research		106		
مَ	Project 644778		Page 2 of 6 Pages		Exhibit R-2 (PE 0603850F)	)603850F)

	RDT&E BUDGET ITEM JUSTIFI	CATION	STIFICATION SHEET (R-2 Exhibit)	R-2 Exhi	bit)	۵	DATE February 2000	2000
BUD <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603850F Integr	AND TITLE Fintegrate	ed Broadca	ast Servic	PENUMBER AND TITLE 0603850F Integrated Broadcast Service (DEMIVAL)	PROJECT <b>644778</b>
(£)	C. Program Change Summary (\$ in Thousands) Continued			EY 1999	EX 2000		FY 2001	Total Cost
	d. Below Threshold Reprogram e. Rescissions f. Other			C	-52			TBD
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR *FY 1999 IBS RDT&E funds are consolidated in USN PE 0305972N.	.972N.		0	24,198		-218 24,488	TBD
9	Significant Program Changes:  - USAF added \$47.4M (RDT&E) for FY 1999-2003 for a partial consolidation of IBS legacy systems' funding.  - USAF transferred funds in FY 1999 from PE 0208019F/BPAC 674778 to PE 0603850F  - USN received \$24.9M in a Congressional transfer of IBS and IBS legacy funds in the FY 1999 budget: \$14.580M in RDT&E, \$10.271M in OP  - USAF added an additional \$68.1M (RDT&E) in the FY 2000-2005 budget to complete the consolidation of IBS legacy funds under a single PE.	al consolidatic 5 674778 to P IBS legacy fu 2005 budget 1	on of IBS legar PE 0603850F ands in the FY to complete th	cy systems' fur 1999 budget: e consolidation	nding. \$14.580M in ] n of IBS legacy	RDT&E, \$10 y funds under	or a partial consolidation of IBS legacy systems' funding. 9F/BPAC 674778 to PE 0603850F IBS and IBS legacy funds in the FY 1999 budget: \$14.580M in RDT&E, \$10.271M in OPN. FY 2000-2005 budget to complete the consolidation of IBS legacy funds under a single PE.	
<u>e</u>	D. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000 Actual Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to	Total Cost
999	1,0 nsferred to	the Navy by Congress.					0 0	
<u> </u>	E. Acquisition Strategy IBS will use an incremental development program to create a common dissemination architecture. Systems and technology will be contracted for under a competitive Request for Proposal (RFP) process.	mmon dissem	nination archite	ecture. System	is and technole	ogy will be co	intracted for under a	competitive
<u> </u>	F. Schedule Profile		FY 1999		FY 2000	000	FY 2001	1001
	Project 644778	Page	Page 3 of 6 Pages				Exhibit R-2 (PE 0603850F)	= 0603850F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R	-2 Exh	libit)		<u> </u>	DATE <b>F</b> 6	February 2000	, 2000	
BUDGE <b>04 - D</b>	вирсет аститу 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service (DEM/VAL)	Ю ТІТLЕ <b>Integra</b> f	ted Bro	oadcast (	Servic	e (DEN	A/VAL)	PROJECT <b>644778</b>	ест <b>778</b>
(U) E	F. Schedule Profile Continued	FY 1999 2 3	4	1	EY 2000 2 3	4	1	FY 2001 2	2 <u>001</u> 3	4
<u> </u>	Master Acquisition Plan Spiral 1 - Design - Development - Accreditation Efforts Begin - CANX/CUBE Activities Begin Initiate Program Replan Program Replan Approval Phase I - Quick Pass, Pre-ASP, ASP - Release RFP - Phase I Multiple Awards - Phase I Completion * - Denotes completed event X - Denotes planned event	*		*	× ×		×			
Proj	Project 644778	Page 4 of 6 Pages					Exhit	Exhibit R-2 (PE 0603850F)	E 06038	50F)
		003								

	RDT&E PROGRAM ELEMEN	ZAM ELE		I/PROJECT COST BREAKDOWN (R-3)	OST BF	REAKDO!	WN (R-3)		DATE <b>Fe</b>	February 2000	000
∄ <b>6</b>	вирсет астилту 04 - Demonstration and Validation	alidation			PE NUMBI 060385	PENUMBER AND TITLE  0603850F Integrated Broadcast Service (DEM/VAL)	ited Broad	cast Serv	ice (DEM	IVAL)	PROJECT <b>644778</b>
9	A. Project Cost Breakdown (\$ in Thousands)	\$ in Thousanc	(SI				FV 1000	000	EV 2000	5	FV 2001
55555	Program Management System Engineering Information Management Element (Phase I & Phase II Common Message Format Development DT&E Total	nent (Phase I & velopment	; Phase II)						2,123 2,123 4,913 16,180 982 0 0 24,198	23 80 82 0 88 0	2,156 2,156 2,750 18,109 1,000 473 24,488
	*FY 1999 IBS funds are in USN PE 0305972N	N PE 0305972	Z								
9	B. Budget Acquisition History and Planning Inform	y and Plannin	g Informatio	nation (S in Thousands)	(SI						
ව	Performing Organizations: Contractor or Government Performing Activity	Contract Method/Type or Funding	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	TBD (Phase I & II) FFP/C	ations FFP/CPAF	My00/Jan01	TBD	TBD	0	0	18,843	19,783	Continuing	TBD
	Support and Management Organizations MITRE/ITSP  Test and Evaluation Organizations JITC/46th OSS  Project Or	anizations CPFF ions Project Order	Oct 98 TBD	TBD	TBD	0 0	0 0	5,355	4,232	Continuing Continuing	TBD
ච	Government Furnished Prop Item Description Product Development Property TBD	erty: Contract Method/Type or Funding Vehicle	Award or Obligation Date	Delivery <u>Date</u>		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> <u>Program</u> TBD
	Project 644778			Pag	Page 5 of 6 Pages	jes	:		Exhib	Exhibit R-3 (PE 0603850F)	)603850F)

	RDT&E PROGRAM ELEMENT/PROJECT (	//PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	000
<b>2</b> 8	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603850F Integrated Broadcast Service (DEM/VAL)	ted Broad	cast Serv	ice (DEM	(VAL)	РРОЈЕСТ <b>644778</b>
(D)		0	0	0	0	Continuing	TBD
	Test and Evaluation Property TBD Subtotals Cubtotal Develorment	0 Total Prior to FY 1999	0 <u>Budget</u> FY 1999	0 <u>Budget</u> FY 2000 18 843	0 Budget FY 2001 19 783	Continuing  Budget to  Complete TRD	TBD Total Program TBD
	Subtotal Frounct Developinent Subtotal Support and Management Subtotal Test and Evaluation Total Project	000	000	5,355 0 24,198	4,232 473 24,488	TBD TBD TBD	TBD TBD TBD
					֧֧֧֓֞֟ ֓ ֓		
	Project 644778	Page 6 of 6 Pages			EXUID	Exhibit K-3 (PE Ubu383UF)	Jeussaur)

PE NUMBER: 0603851F PE TITLE: ICBM - DEM/VAL

	RDT&E BUDGET ITEM JU		STIFICATION SHEET (R-2 Exhibit)	SHEET	(R-2 Ex	hibit)		DATE	Februa	February 2000
BUDGET ACTIVITY 04 - Demons	BUDGET ACTIVITY  04 - Demonstration and Validation	:		PE NUMBER AND TITLE 0603851F ICBM	AND TITLE FICBM	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	٩Ľ			
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	27,409	47,075	39,246	44,231	47,638	48,592	49,550	Continuing	TBD
641020	ICBM Guidance Applications	5,349	666'6	16,165	18,192	20,233	20,636	21,044	Continuing	TBD
641021	ICBM Propulsion Applications	171	179	177	1,666	1,645	1,678	1,710	Continuing	TBD
641022	ICBM Reentry Vehicle Applications	8,656	15,632	20,439	21,536	22,957	23,417	23,879	Continuing	TBD
641023	Rocket System Launch Program	10,936	18,930	34	32	33	34	35	Continuing	TBD
641024	ICBM Command & Control (C2) Applications	171	179	177	438	433	443	451	Continuing	TBD
644209	Long Range Planning (LRP)	2,126	2,156	2,254	2,367	2,337	2,384	2,431	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

# (U) A. Mission Description

ensure continued ICBM viability. Program includes demonstration and validation projects for ICBM guidance options, support reentry vehicles beyond original design Efforts identify methods to reduce life cycle costs, improve nuclear safety and surety, support international arms control agreements and disengagement strategies, and life, provide an assessment of current and future ICBM propulsion systems, and develop enhancements to ensure command and control capabilities.

# (U) B. Budget Activity Justification

This program is in Budget Activity 4 - Demonstration and Validation because the projects are demonstrating the general military utility and/or cost reduction potential of advanced technologies.

Page 1 of 28 Pages

Exhibit R-2 (PE 0603851F)

DECORT ACTUMENT   DEMONSTRATION   DEMONSTRATION   DEMONSTRATE	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)	()	DATE February 2000	
	tion	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	AIVAL		
	in Thousands)	HV 1999	FV 2000	EV 2001	Total Cost
	00 PBR)	27,254	28,628		TBD
		27,337	47,828		
	S	-83			
	ich Id Renrogram	<del>.</del>	-380		
		309	}		
		-153	-373		
	FY 2000 PBR			-2,447	TBD
	ኧ	27,409	47,075	39,246	TBD
<ul><li>(U) Changes to FY99 funding included payback to</li><li>(U) FY00 includes a congressional add of \$19,200</li><li>(U) FY01 funding in ICBM Reentry Vehicle Appli</li></ul>					-
(U) FY00 includes a congressional add of \$19,200 (U) FY01 funding in ICBM Reentry Vehicle Appli	ded payback to ICBM Guidance Applicat	tions for FY98 Omnibus which	provided funding for	efforts deferred from FY98.	
(U) FY01 funding in ICBM Reentry Vehicle Appli	add of \$19,200 in the Rocket System Lau	nch Program (RSLP) project to	demonstrate a quick	reaction launch capability.	
	y Vehicle Applications project reduced to	support higher Air Force and D	OD priorities.		
	Page	Page 2 of 28 Pages		Exhibit R-2 (PE 0603851F)	851F)

	RDT&	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFICA	VTION S	энеет (	R-2A E	xhibit)		DATE	February 2000	y 2000
BUDC <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation	and Validation			PE NUMBER AND TITLE 0603851F ICBM	R AND TITLE	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	AL			PROJECT <b>641020</b>
	COST (\$ ir	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
641020	20 ICBM Guidance Applications	plications	5,349	666'6	16,165	18,192	20,233	20,636	21,044	Continuing	TBD
(C)	A. Mission Description	<u>uo</u> ,									
	The ICBM Guidance continued readiness o CINCSTRATCOM g disengagement strates community. The effo Guidance Application	The ICBM Guidance Applications Project is required to meet on-going needs in applied strategic guidance systems and their subcomponents. This project ensures the continued readiness of our strategic deterrent forces in response to the Nuclear Posture Review, recommendations of the USSTRATCOM Strategic Advisory Group, CINCSTRATCOM guidance, and the Defense Science Board Task Force on Nuclear Deterrence. Efforts within this project are focused on current and future missions disengagement strategies, reduced life cycle costs, and increased nuclear surety and safety. These activities leverage the efforts of the Science and Technology community. The efforts are coordinated with the Navy efforts so as to avoid duplication while realizing maximum return on the invested dollars. A key element of the Guidance Applications Project is the continued preservation of the minimum technical skills and capabilities needed to respond to major modifications to the	to meet on-y n response to se Board Tas d increased r yy efforts so i	going needs the Nuclea k Force on I nuclear suret as to avoid c minimum t	in applied sir Posture Re Nuclear Dett y and safety Iuplication v technical ski	trategic guid view, recom strence. Eff. These acti vhile realizii	lance system imendations orts within the vities levera in maximum bilities need	is and their s of the USST his project a ige the effor a return on the	ubcompone FRATCOM re focused o is of the Scii he invested of	nts. This pro Strategic Adv n current and ence and Tecl dollars. A ke	o meet on-going needs in applied strategic guidance systems and their subcomponents. This project ensures the response to the Nuclear Posture Review, recommendations of the USSTRATCOM Strategic Advisory Group, Board Task Force on Nuclear Deterrence. Efforts within this project are focused on current and future missions, increased nuclear surety and safety. These activities leverage the efforts of the Science and Technology efforts so as to avoid duplication while realizing maximum return on the invested dollars. A key element of the ration of the minimum technical skills and capabilities needed to respond to major modifications to the
	Minuteman guidance	Minuteman guidance system as well as any degradation of the aging hardware. These unique guidance efforts will demonstrate utility and cost savings potential.	on of the agi	ng hardware	e. These uni	que guidanc	e efforts wil	l demonstra	te utility and	cost savings	potential.
55555	FY 1999 (\$ in Thousands) \$2,618 Con \$2,273 Con \$458 Cor \$5,349 Tot	ands)  Completed initial AF/Navy coordinated LN-195 guidance system pod flight testing using a high-performance aircraft platform.  Continued development and testing of a prototype thrust axis accelerometer concept for strategic guidance system applications.  Continued radiation hardened parts efforts.  Total	ordinated LN sting of a pro parts efforts.	1-195 guidar etotype thru:	nce system p st axis accel	od flight tes erometer cor	ting using a	high-perfon ategic guida	mance aircra nce system a	ıft platform. ıpplications.	
99	EY 2000 (\$ in Thousands) \$3,808 Cor rad	ands)  Continue development and test of thrust axis accelerometer prototype to improve performance, design brass board electronics, and address radiation hardness environment impacts. Continue fiber optic gyroscope development for strategic advanced inertial measurement unit. B	t of thrust ax	is acceleron ontinue fibe	neter prototy er optic gyro	pe to improv scope devel	ve performaı opment for s	nce, design ł strategic adv	orass board e	electronics, ar al measureme	of thrust axis accelerometer prototype to improve performance, design brass board electronics, and address impacts. Continue fiber optic gyroscope development for strategic advanced inertial measurement unit. Begin
9	\$3,976	design of micro mechanical electronics for common strategic guidance system.  Continue development and test radiation hardened application-specific integrated circuits (ASICs) and a radiation hardened high throughput	ectronics for t radiation ha	common str irdened appl	rategic guida lication-spec	ınce system. ific integrate	ed circuits (1	ASICs) and	a radiation h	ardened high	throughput
5	\$2,215	Continue development of advanced inertial measurement unit (AIMU) concepts emphasizing mechanical, electrical, cooling, data interfaces, and inflicht undates. Perform tests and desion changes for meeting performance, and compatibility goals.	inced inertial	measureme	nts. int unit (AIIV meeting neri	(U) concept	s emphasizir	ng mechanic	al, electrical	l, cooling, dat	a interfaces, and
9	666'6\$	Total					, and	og Carronad			
<u> </u>	Project 641020			Page	Page 3 of 28 Pages	SS			Ä	hibit R-2A (	Exhibit R-2A (PE 0603851F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	JUSTIFICATION	ON SHEET (F	R-2A Exh	ibit)	DATE	г February 2000	00
80D <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation		PE NUMBER AND TITLE 0603851F ICBM	PE NUMBER AND TITLE OG03851F ICBM - DEM/VAL	EM/VAL		9	РВОЈЕСТ <b>641020</b>
3	A. Mission Description Continued						:	
9999999	FY 2001 (\$\sec{s}\$ in Thousands) \$4,233 Continue the design, test, and integration of thrust axis accelerometer. \$4,340 Continue development of radiation hard ASICs and high throughput microprocessor. \$3,036 Continue design and development of micro mechanical electronics for common guidance system. \$2,450 Complete development and test of AIMU concepts. \$2,106 Continue follow-on development and demonstration of concepts for common strategic guidance system technology. \$16,165 Total	, and integration of thru. Fradiation hard ASICs a elopment of micro mech nd test of AIMU concep lopment and demonstra!	st axis acceleromete ind high throughput nanical electronics f its.	er. microprocesso or common gu common strate	or. idance system. igic guidance s	system technolo	gy.	
9	B. Project Change Summary BTR payback of FY98 Omnibus allowed funding some	g some of the activities	of the activities deferred from FY98 in FY99.	8 in FY99.				
<b>E</b>	C. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000  Actual Estimate	housands) FY 2000 EX 2001 Estimate Estimate	FY 2002 te Estimate	Extimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
<u> </u>	None.							
3	<b>D. Acquisition Strategy</b> Accomplish studies and analyses as well as limited engineering and pre-prototype hardware development. All efforts will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.	ted engincering and pre- deemed more appropri	prototype hardware ate.	development.	All efforts wi	II be conducted	under the ICBM Prin	ō
9	E. Schedule Profile		EY 1999 1 2 3	4	EY 2000 1 2 3	000 3	$\frac{\text{FY } 2001}{1}$	<u>1</u> 3 4
9	Resume/Complete Advanced IMU Integration Assessments (See Note)	Assessments (See			*			×
9	Start Common Strategic Guidance Systems Technology Studies	hnology Concepts					×	
9	Inertial Instrument Technology Development (Began 1QFY97,	legan 1QFY97,						
9	•	Y97, Ongoing) s began 1st Qtr, FY96;	however efforts sus	pended in FY9	9 due to congr	essional fundin	g reduction. Project r	esumed in
	Project 641020		Page 4 of 28 Pages	S			Exhibit R-2A (PE 0603851F)	03851F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (R-2A Exhibit	(;	DATE Fe	February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	NAL		PROJECT <b>641020</b>
(U) E. Schedule Profile Continued	FY 1999 2 3 4 1	EY 2000 2 3	4 1	EY 2001 2 3 4
FY00. * - Completed Event X - Planned Event				
Project 641020	Page 5 of 28 Pages		Exhibit F	Exhibit R-2A (PE 0603851F)

	RDT&E PROGRAM ELEMENT	AM ELE		/PROJECT (	SOST BE	COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	0
8UD <b>4</b>	вирсет астіліту <b>04 - Demonstration and Validation</b>	lidation			PE NUMBER AN <b>0603851F</b>	PE NUMBER AND TITLE 0603851F ICBM -	ND TITLE ICBM - DEM/VAL		:	Б	РРОЈЕСТ <b>641020</b>
3	A. Project Cost Breakdown (\$ in Thousands)	in Thousand	(8				EV 1000	000	HV 2000		FV 2001
5	Advanced TMU Concents						7,7	2,618	2,215	A F	2,450
3	Instruments						2,5	2,273	3,808	8	4,233
3	Rad Hardness						7	458	3,976	2	4,340
333	Common System Concepts Micro Mechanical Electronics Total						ζ,	5,349	666'6	0	2,106 3,036 16,165
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	and Plannin	<u>Information</u>	ı (S in Thousaı	(spi						
9	Performing Organizations:										*
	Contractor or										
	Government	Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
		Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Development Organiz	ions									
	TRW (Prime) C/	C/CPAF	Dec 97	Continuing	Continuing	6,177	5,294	9,939	16,105	Continuing	TBD
	Litton C/	C/CPAF	Aug 91	18,777	18,777	18,777	0	0		0	18,777
	Lockheed-Martin C/	C/CPAF	Aug 91	4,136	4,136	4,136	0	0		0	4,136
	Charles Draper Labs (CSDL) C/CPAF/FFP	/CPAF/FFP	Nov 91	11,736	11,736	11,736	0	0		0	11,736
	ort and Management Orga	nizations	;		•	,	•	Ć		Ċ	
		SS/CPAF	Oct 95	1,607	1,607	1,607	<b>o</b> ;	0 ;	ţ	O .	1,60/
	Other Engineering Support Va	Various	As Req'd	Continuing	Continuing	3,335	25	09	09	Continuing	CRT.
	Test and Evaluation Organizations	Suoi Mipp	As Beald	2 455	2455	2 455	c	C		С	2.455
	nidance Test	1 O	As Rea'd	1.396	1,396	1,396	0	0		0	1,396
	Facility	ľ	<b>-</b>		•						
	Navy SSP M	MIPR	Annual	816	816	816	0	0		0	816
	Wright Labs M	MIPR	Jan 97	200	200	200	0	0		0	200
	Project 641020			P	Page 6 of 28 Pages	ges			Exhib	Exhibit R-3 (PE 0603851F)	3851F)
1											

RDT&E PROGRAM ELEMENT/PROJECT C	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	٥
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	DEMIVAL			PR <b>6</b>	РРОЈЕСТ <b>641020</b>
(U) Government Furnished Property:  Contract  Method/Type Award or  Method/Type Award or  Item or Funding Obligation Delivery  Description Vehicle Date  Product Development Property  None  Support and Management Property  None  Test and Evaluation Property  None	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	Total Prior to FY 1999 40,826 4,942 4,867 50,635	Budget FY 1999 5,294 55 0 5,349	Budget FY 2000 9,939 60 0 9,999	Budget EY 2001 16,105 60 16,165	Budget to Complete TBD TBD 0 TBD	Total Program TBD TBD 4,867 TBD
Project 641020	Page 7 of 28 Pages			Exhibi	Exhibit R-3 (PE 0603851F)	3851F)

	RDT&E BUDGET ITEM JUS	JUSTIF	CATI	S NO	HEET (	STIFICATION SHEET (R-2A Exhibit)	xhibit)		DATE	February 2000	y 2000
BUD( <b>04</b>	BUDGET ACTIVITY				PE NUMBER AND TITLE 0603851F ICBM	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	- DEM/V,	AL			PROJECT <b>641021</b>
	COST (\$ in Thousands)	FY 1999 Actual		FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
641021	)21 ICBM Propulsion Applications		171	179	177	1,666	1,645	1,678	1,710	Continuing	TBD
3	A. Mission Description										
	The ICBM Propulsion Applications project explores improvements and/or alternatives to current ICBM propulsion systems as well as conducting studies assessing future ICBM propulsion system requirements.	lores improve	ments an	d∕or alte	rnatives to c	current ICB	M propulsio	n systems as	s well as con	ducting studie	s assessing
999	FY 1999 (\$ in Thousands) \$171 Completed propulsion cost and \$171 Total		nance stu	dies for	Ballistic M	performance studies for Ballistic Missile Replacement (BMR) design concepts.	ement (BM	R) design o	oncepts.		
999	FY 2000 (\$ in Thousands) \$179 Conduct studies and assessment of technological developments in support of ICBM propulsion system(s). \$179 Total	ssment of tecl	nologica	ıl develo	pments in s	upport of IC	BM propuls	sion system(	(s)·		
999	FY 2001 (\$ in Thousands) \$177 Continue studies and assessment of technological developments in support of ICBM propulsion system(s). \$177 Total	essment of tec	hnologic	al develc	opments in :	support of I(	CBM propul	lsion system	(s).		
3	B. Project Change Summary No significant changes.										
<u>e</u>	C. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000  Actual Estimate	housands) FY 2000 Estimate	FY 2001 Estimate		FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	<b>—</b>	FY 2005 Estimate	Complete	Total Cost
9	None										
9	<b>D. Acquisition Strategy</b> Studies and analyses will be accomplished. All efforts will be conducted under the ICBM Prime Integration Contractor unless other strategies are deemed more appropriate.	efforts will be	conducte	ed under	the ICBM	Prime Integr	ration Contr	actor unless	other strate	gies are deeme	ed more
Δ.	Project 641021			Page 8	Page 8 of 28 Pages	S			Ē	thibit R-2A (F	Exhibit R-2A (PE 0603851F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	ON SHEET (R-2A Exhibit)	DATE February 2000
вирсет аститту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	PROJECT <b>641021</b>
(U) E. Schedule Profile	EX 1999 EY 2000	EY 2001
(U) Begin/Complete BMR Design Concept Study Conduct Studies & Technology Assessments (Began 1QFY00, Ongoing) *- Completed Event X - Planned Event	n * **	
Project 641021	Page 9 of 28 Pages	Exhibit R-2A (PE 0603851F)

	RDT&E PROGRAM ELEMEN	GRAM ELE		/PROJECT	COST BF	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	s e
BUE <b>9</b>	вирсет астіліту 04 - Demonstration and Validation	Validation			PE NUMBI 060385	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	DEMIVAL			9	РRОЈЕСТ <b>641021</b>
(£)	A. Project Cost Breakdown (\$ in Thousands)	n (\$ in Thousanc	<u>1</u> 5				FY 1999	666	FY 2000	9	FY 2001
99	Contract Engineering Support Total	ort					1	171	179	366	771 771
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	tory and Plannin	g Informatio	n (\$ in Thousa	( <del>spu</del>						
9	Performing Organizations: Contractor or	Contract									
	Government Performing	Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity FAC	Project Office FAC	Total Prior	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Product Development Organizations	nizations									
	TRW (Prime) Atlantic Research	C/CPAF SS/CPAF	Dec 97 Annual	Continuing 640	Continuing 640	167 640	167	175	172	Continuing	TBD 640
	Support and Management Organizations Prog Management Various	rganizations Various	As Req'd	Continuing Continuing	Continuing	27	4	4	5	Continuing	TBD
	Test and Evaluation Organizations None	zations									
9	Government Furnished Property: Cont Meth Item Description Product Development Property None Support and Management Property None Test and Evaluation Property None	contract Contract Method/Type or Funding Vehicle arty roperty	Award or Obligation Date	<u>Delivery</u> <u>Date</u>		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Project 641021			Pa	Page 10 of 28 Pages	ıges			Exhib	Exhibit R-3 (PE 0603851F)	03851F)

RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	COST BREAKDOV	VN (R-3)		DATE <b>Fe</b>	February 2000	٩
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	DEMIVAL			ă <b>9</b>	PROJECT <b>641021</b>
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evolution	Total Prior to FY 1999 807 27	Budget FY 1999 167	Budget FY 2000 175	Budget FY 2001 172 5	Budget to Complete TBD TBD	Total Program TBD TBD
Subtoral Test and Evaluation  Total Project	834	171	179	177	TBD	TBD
Project 641021	Page 11 of 28 Pages			Exhibi	Exhibit R-3 (PE 0603851F)	)3851F)

	RDT&	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFICA	TION S	HEET (	R-2A E	xhibit)		DATE	February 2000	ry 2000
80DG <b>04</b> -	вирсет астіліту 04 - Demonstration and Validation	and Validation			PE NUMBER AND TITLE 0603851F ICBM	R AND TITLE	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	AL			PROJECT <b>641022</b>
	COST (\$ ir	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
641022	22 ICBM Reentry Vehicle Applications	cle Applications	8,656	15,632	20,439	21,536	22,957	23,417	23,879	Continuing	TBD
<u> </u>	A. Mission Description	ūo		-	:						
	ICBM Reentry Vehic directing the downloa options for satisfying meeting real on-going identify life cycle cost phenomena and future Navy RV efforts to el.	ICBM Reentry Vehicle (RV) Applications efforts are required to support the deployed ICBM force with emphasis on implementing arms control treaties/initiatives directing the downloading of the Minuteman force to a single RV configuration, equipping the Minuteman force with the safest and most reliable RVs, and exploring options for satisfying future requirements. These efforts will support RVs beyond their original design life by addressing problems with operational reentry systems, meeting real on-going needs, and ensuring the availability of long-lead components/materials. This project will develop methods to better predict aging phenomena and identify life cycle cost reduction methods. Additionally, these efforts will maintain a minimum level of technical engineers and critical skills to respond to aging phenomena and future requirements. RV work conducted under this program will leverage the Science & Technology community investments and coordinate with Navy RV efforts to eliminate duplication and realize synergistic cost savings.	required to a single RV orts will suppivility of longibly, these efficieted under the synergistic co	support the c configuratic oort RVs bey lead compo orts will mains program ost savings.	deployed ICi on, equipping yond their or ments/mater intain a mini will leverag	BM force wig the Minute iginal designal designals. This primum level of the Science of the Science	ith emphasis sman force v n life by add oject will de of technical of	on impleme vith the safetressing prober velop methengineers and logy community.	enting arms of and most rated most rated most rolems with of ods to better of critical skill mity investments.	control treativeliable RVs, perational repredict agin, predict agin, ills to respon tents and coc	required to support the deployed ICBM force with emphasis on implementing arms control treaties/initiatives is single RV configuration, equipping the Minuteman force with the safest and most reliable RVs, and exploring its will support RVs beyond their original design life by addressing problems with operational reentry systems, lility of long-lead components/materials. This project will develop methods to better predict aging phenomena and ly, these efforts will maintain a minimum level of technical engineers and critical skills to respond to aging sted under this program will leverage the Science & Technology community investments and coordinate with ynergistic cost savings.
9	FY 1999 (\$ in Thousands)	spur (spur									
3	\$3,892	Performed ground and flight tes	sts in contin	uing evaluat	tion of RV n	naterial subs	ystems, mat	erials aging,	and materia	ts in continuing evaluation of RV material subsystems, materials aging, and material replacements.	ıts.
<u> </u>	\$2,364 \$664	Continued design, development, and prototype testing of selected fuze assessment/measurement methodologies. Continued design, development, and prototype testing of selected sensors/instruments.	it, and protot	ype testing o	of selected f of selected s	uze assessm ensors/instru	ent/measure	ment metho	dologies.		
3	\$646	Continued identifying and ground testing potential replacement options for critical RV components.	ind testing p	otential repl	acement opt	ions for criti	ical RV com	ponents.			
99	\$1,090 \$8,656	Continued evaluation of improv Total	ved accuracy	y assessmen	ed accuracy assessment measurement methodology	ent methodo	logy.				
9	FY 2000 (\$ in Thousands)	ands)									
<u> </u>	\$5,432	Continue evaluation of RV material subsystems, materials aging, and material replacements by performing ground and flight tests.	terial subsys	tems, mater	ials aging, a	nd material 1	replacement	s by perform	ing ground	and flight tes	its.
<u>3</u>	\$3,463 \$2,176	Continue design, development, and prototype testing of selected fuze ass Evaluate advanced common RV designs, applications, and technologies.		pe testing of oplications,	r selected ru and technolc	ze assessme. gies.	and prototype testing of selected fuze assessment/measurement methodologies. / designs, applications, and technologies.	nent method	ologies.		
<u>(5)</u>	\$2,478	Develop and assess RV Test &	Evaluation	methodolog	Evaluation methodologies and subsystems.	ystems.					
<u> </u>	\$1,050 \$1,033	Continue identifying and ground testing potential replacement options for critical KV components. Continue to evaluate improved accuracy measurement and methodology.	nd testing po accuracy mo	tential repla easurement	d testing potential replacement options to accuracy measurement and methodology.	ons tor critic ology.	al KV comp	onents.			
<u>3</u>	\$15,632	Total				}					
Δ	Project 641022			Page 1	Page 12 of 28 Pages	v a			П	hihit R-2A (	Exhibit R-2A (PE 0603851E)
	2201010000			1 282 1	90 1 07 10 7				Š	1 2 1 1 2	1 200000 = 1

	RDT&E BUDGET ITEM JUS	M JUSTIFI	TIFICATION SHEET (R-2A Exhibit)	SHEET (F	3-2A Exh	ibit)	DΑ	DATE February 2000	2000
BUE <b>8</b>	виреет астилту 04 - Demonstration and Validation			PE NUMBER AND TITLE 0603851F ICBM	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	EM/VAL			РRОЈЕСТ <b>641022</b>
9	A. Mission Description Continued								
55555	<ul> <li>EY 2001 (\$ in Thousands)</li> <li>\$5,543 Continue evaluation of RV material subsystems, materials aging, and material replacements by performing ground and flight tests.</li> <li>\$1,853 Evaluate alternate flight test experiment options.</li> <li>\$3,976 Continue design, development, and prototype testing of selected fuze assessment/measurement methodologies.</li> <li>\$3,772 Continue evaluation of advanced common RV designs, annlications, and technologies.</li> </ul>	'RV material sulnt test experimen opment, and pro	rial subsystems, materials aging, and material replacer sriment options. nd prototype testing of selected fuze assessment/meas	rials aging, and selected fuze, annlications.	d material repla e assessment/m and technolog	acements by p	erforming grou lethodologies.	nd and flight tests.	
3333	\$2,567 \$1,523 \$1,205 \$20,439	and assessment nd ground testin improved accur	of RV Test & Is potential replace, measurement	Evaluation mer acement option and methoc	thodologies an as for critical F lology.	d subsystems.	s <del>i</del>		
9	B. Project Change Summary FY01 request reduced by \$2,300 to support higher Air I planned effort deferred a year.	gher Air Force p	riorities. The l	FY01 task to e	valuate alterna	te flight test e	xperiment opti	Force priorities. The FY01 task to evaluate alternate flight test experiment options reduced accordingly; some	ngly; some
<u> </u>	C. Other Program Funding Summary (S in Thousands)  FY 1999  EY 2000  Actual  Estimate	Thousands) EY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
9	None								
9	D. Acquisition Strategy Studies and analyses as well as limited engineering and pre-prototype hardy Integration Contractor unless other strategies are deemed more appropriate.	ering and pre-proure deemed more	ototype hardwa appropriate.	re developmer	ıt will be accor	nplished. All	efforts will be	pre-prototype hardware development will be accomplished. All efforts will be conducted under the ICBM Prime d more appropriate.	
<u>e</u>	E. Schedule Profile		_	FY 1999	4	FY 2000	2000 3	FY 2001	901 3 4
<u> </u>	MATERIALS REPLACEMENT & AGING EVALUATION Design, Develop & Test Selected Technologies (Began IQFY96, Ongoing)  FUZE ASSESSMENT Design, Develop & Test Measurement Tools (Began IQFY96,	:VALUATION ;ies (Began IQFY9 ; (Began IQFY96,	Y96, 6,	1				,	
	Project 641022		Page	Page 13 of 28 Pages	10			Exhibit R-2A (PE 0603851F)	0603851F)

RDT&E BUDGET ITEM JUSTIFICAT	TIFICATION SHEET (R-2A Exhibit)	DATE February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	PROJECT <b>641022</b>
(U) E. Schedule Profile Continued	FY 1999 FY 2000	EY 2001 4 1 2 3 4
Ongoing)  (U) SENSOR/INSTRUMENTATION INTEGRATION  (U)Design, Develop & Test Sensors/Instruments (Began 1QFY96, Ongoing)  (U) CRITICAL COMPONENTS  (U)Design, Develop & Test Replacement Options (Began 1QFY96, Ongoing)  (U) RY TEST & EVALUATION METHODOLOGIES  (U)Design, Develop & Test Methods/Subsystems (Began 1QFY00, Ongoing)  (U) ACCURACY ASSESSMENT METHODOLOGY  (U)Evaluate Accuracy Measurement Techniques (Began 1QFY96, Ongoing)  (U) ADVANCED COMMON RV DESIGNS, APPLICATIONS & TECHNOLOGIES Identify & Evaluate Options (Ongoing)  (U) ALTERNATE FLIGHT TEST OPTIONS Identify, Develop & Test Options (Begins 1QFY01, Ongoing)  * - Completed Event  X - Planned Event	**	
Project 641022	Page 14 of 28 Pages	Exhibit R-2A (PE 0603851F)

	RDT&E PROGRAM ELEMENT	RAM ELE		/PROJECT C	COST BE	COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	0
8UD <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	alidation			PE NUMBER AN <b>0603851F</b>	PE NUMBER AND TITLE 0603851F ICBM -	ICBM - DEMIVAL			Б	PROJECT <b>641022</b>
(D)	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousanc	(8)				0001 753	o	00C AH		EV 2001
(T)	Motorials & Dradiction Methodologies	dologies					<u> </u>	3 807	FX 2000	<b>a</b> ~	5 543
9 (	First A second of the control of the	uologica					, c	2,0,0	20,0	1 6	2,00
<b>9</b> E	ruze Assessinein Sancor/Instruments						,,	,304	5,405	0	5,970
9	Sellsol/Ilisu milelits	•					· \	10.4	•	,	100
<u> </u>	Identify/ground test critical components	mponents						046	1,302	×1 .c	1,/04
<u> </u>	Accuracy Assessment Measures Methodology	es Memodolog.	<b>&gt;</b>				1,1	060	1,055	0	1,202
3	Evaluate Advanced Common RV	RV							2,176	٠,	3,772
3	Develop & Assess RV T&E Methods	<b>Tethods</b>					Č		2,226		2,386
9	Total						<b>∞</b> ,	8,656	15,632	7	20,439
3	B. Budget Acquisition History and Planning Inform	y and Plannin	g Information	ation (\$ in Thousands)	ds)						
3	Performing Organizations:										
	Contractor or	Contract									
	Government	Method/Type	Award or	<u>Performing</u>	<b>Project</b>						
	Performing Assister	or Funding	Obligation Deta	Activity	Office	Total Prior	Budget	Budget EV 2000	Budget EV 2001	Budget to	Total
	Product Development Organizations	ations	A STREET	<b>X</b>	<b>X</b>	7771178				<u>सम्भातीमात्रः</u>	100
	Textron	C/CPAF	Various	8,636	8,636	8,636	0	0		0	8,636
	Lockheed-Martin	C/CPAF	Various	13,530	13,530	13,530	0	0		0	13,530
	Boeing-North American	C/CPAF	Various	260	260	260	0	0		0	260
	TRW (Prime)	C/CPAF	Dec 97	Continuing	Continuing	404	7,796	14,157	18,639	Continuing	TBD
	Support and Management Organizations	anizations									
	TRW	SS/CPAF	Oct 95	2,692	2,692	2,692	0	0		0	2,692
	Other Engineering & Management Support	Various	Ongoing	Continuing	Continuing	515	59	100	100	Continuing	TBD
	Project 641022			Pag	Page 15 of 28 Pages	ges			Exhibi	Exhibit R-3 (PE 0603851F)	3851F)

	RDT&E PROGRAM ELEMENT	ZAM ELE		/PROJECT COST BREAKDOWN (R-3)	COST BF	REAKDON	VN (R-3)		DATE <b>Fe</b>	February 2000	00
8UD(	BUDGET ACTIVITY 04 - Demonstration and Validation	ılidation			PE NUMBER AN <b>0603851F</b>	PE NUMBER AND TITLE 0603851F ICBM -	ICBM - DEM/VAL			<b>9</b>	PROJECT <b>641022</b>
(D)	Performing Organizations Continued: Test and Evaluation Organizations Wright Lab AEDC Sandia National Lab (SNL) Vandenberg AFB NH & S	continued: tions MIPR PO MIPR PO	Annual Annual As Req'd As Req'd As Req'd	Continuing Continuing Continuing Continuing Continuing	Continuing Continuing Continuing Continuing Continuing	686 972 83 0	291 280 0 230 0	450 475 0 250 200	450 700 250 300	Continuing Continuing Continuing Continuing Continuing	08T 08T 08T 08T 08T
9	Government Furnished Property:  Continue Meth Item Orescription Product Development Property None	act od/Type nding ale	Award or Obligation Date	Delivery Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Support and Management Property None Test and Evaluation Property None Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	ert <u>y</u>				Total Prior to FY 1999 23,130 3,207 1,741 28,078	Budget FY 1999 7,796 59 801 8,656	Budget EY 2000 14,157 100 1,375 15,632	Budget FY 2001 18,639 100 1,700 20,439	Budget to Complete TBD TBD TBD TBD	Total Program TBD TBD TBD TBD
۵	Project 641022			Pa	Page 16 of 28 Pages	səs.			Exhib	Exhibit R-3 (PE 0603851F)	3851F)

	RDT&E BUDGET ITEM JU	STIFIC/	ATION (	STIFICATION SHEET (R-2A Exhibit)	R-2A E	xhibit)		DATE	February 2000	y 2000
BUDC <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603851F ICBM	RAND TITLE FICBM	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	۸L			PROJECT <b>641023</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
641023	23 Rocket System Launch Program	10,936	18,930	34	32	33	34	35	Continuing	TBD
9	A. Mission Description									
	This task supports studies/analysis on hardware for cost effective use of excess missile assets.	ost effective	use of exce	ss missile ass	ets.					
9999	FY 1999 (\$ in Thousands) \$29 Continued on-going study/analysis for the adoption of low cost front-end systems for use on deactivated missile assets. \$10,907 Conventional Ballistic Missile (CBM) funding (under review) \$10,936 Total	Jysis for the (CBM) fund	adoption of ding (under	low cost froi review)	nt-end syster	ns for use o	n deactivate	d missile as	sets.	
555	<ul> <li>EY 2000 (\$ in Thousands)</li> <li>\$32</li> <li>\$18,898</li> <li>Continue on-going study/analysis for the adoption of low cost front-end systems for use on deactivated missile assets.</li> <li>\$18,898</li> <li>Prepare for/conduct two quick reaction launch capability demonstrations; one in support of the Northern Edge Joint Training Exercise and the other as part of the Advanced Solid Axial Stage (ASAS) development effort.</li> </ul>	ysis for the a reaction lau	doption of Is nch capabili Stage (ASA)	ysis for the adoption of low cost front-end syste reaction launch capability demonstrations; one Solid Axial Stage (ASAS) development effort.	Fend system ttions; one ii	s for use on a support of	deactivated the Northen	missile asse n Edge Join	ets. t Training Ex	ercise and the
9	\$18,930 Total		, )	•						
993	FY 2001 (\$ in Thousands) \$34 Continue on-going study/analysis for the adoption of low cost front-end systems for use on deactivated missile assets. \$34 Total	ysis for the a	doption of 1	ow cost fron	-end system	is for use on	deactivated	missile asse	ets.	
9	B. Project Change Summary									
	(U) FY00 \$19,200 Congressional add being used for quick reaction launch capability demonstrations consistent with congressional language.	quick reaction	on launch ca	spability dem	onstrations	consistent w	ith congress	ional langu	age.	
9	C. Other Program Funding Summary (\$ in Thousands)  EY 1999  FY 2000  Actual Estimate	<b>—</b> 4	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	EY 2004 Estimate	[	FY 2005 Estimate	Cost to Complete	Total Cost
5	None	•								
Ω	Project 641023		Раде	Page 17 of 28 Pages	S			ÚÌ	xhibit R-2A (	Exhibit R-2A (PE 0603851F)
				530						

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)		DATE February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	PROJECT <b>641023</b>
(U) <b>D. Acquisition Strategy</b> Studies and analyses will be performed primarily in-house augmented with contractor support as required. Special projects that might be funded under this project that require the development and/or evaluation of hardware along with the associated employment concepts will be awarded to qualified industry sources following open competition.	d with contractor support as required. Special projects that mighe associated employment concepts will be awarded to qualified i	nt be funded under this project that industry sources following open
(U) E. Schedule Profile	FY 1999 FY 2000 1 2 3 4 1 2 3 4	EY 2001
(U) Start/Complete Annual Studies/Analysis (U) -Northern Edge launch (U)ASAS launch * - Completed Event X - Planned Event	*	× ×
Project 641023	Page 18 of 28 Pages	Exhibit R-2A (PE 0603851F)

BUDGET ACTIVITY  O4 - Demons  (U) A. Project  (U) Studies/An;  (U) Quick Reac  (U)Northem  (U)ASAS Qu  (U) CBM Fund  (II) Total	BUDGET ACTIVITY  04 - Demonstration and Validation  (U) A. Project Cost Breakdown (\$ in Thousands)						,				
	roject Cost Breakdown	/alidation			PE NUMBER AN <b>0603851F</b>	PE NUMBER AND TITLE 0603851F ICBM -	ICBM - DEM/VAL			<b>6</b> .	РRОЈЕСТ <b>641023</b>
		(\$ in Thousanc	(S)				FY 1999	666	FY 2000	C	FY 2001
	Studies/Analyses						1	73 73	32	1 e.	34
	Quick Reaction Launch Capability DemonstrationsNorthern Edge Exercise Quick Reaction LaunchASAS Ouick Reaction Launch	bility Demonstrick Reaction Lanch	ations						9,200	<b>~</b> ~	
	CBM Funding (Under Review) Total	W)					10,907 10,936	907 336	18,930		34
(U) B.B.	B. Budget Acquisition History and Planning Information (S in Thousands)	ry and Plannin	g Information	(\$ in Thousand	ଜ						
(U) Perfc	Performing Organizations:										
Contr	Contractor or		•								
Gove Perfo	<u>Government</u> <u>Performing</u>	Method/Type or Funding	Award or Obligation	Pertorming Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
Activity	tity	<u>o</u> j	Date	EAC	EAC	to FY 1999	EY 1999	<b>EY 2000</b>	<b>EY 2001</b>	Complete	Program
Prod	Product Development Organizations	zations									
Textron	uo.	C/CPFF	Apr 97	4,900	4,900	4,900	0	0	0	0	4,900
Textron	uo.	C/CPIF	Aug 98	3,500	3,500	3,500	0	0	0	0	3,500
Textron	uo.	C/CPIF	Aug 98	12,205	12,205	12,205		0	0	0	12,205
AF R	AF Research Lab	MIPR	Mar 97	2,744	2,744	1,744		1,000	0	0	2,744
Wrig	Wright Lab	MIPR	Mar 97	006	006	006	0	0	0	0	900
Flori	Florida National Guard	MIPR	Jul 97/Jan 00	12,198	12,198	2,500		4,600	0	0	7,100
Varions	snı	Varions	As Req'd	N/A	N/A	1,995		1,400	0	0	3,395
Orbit	Orbital Sciences Corp	SS/FPIF	Feb 00	9,200	9,200	0	0	4,900	0	0	4,900
Kodi	Kodiak Launch Complex	SS/FFP	Pending	800	800	0	0	800			800
7-00	OO-ALC/LM (ICBM SPO)	MIPR	Pending	3,000	3,000	0	0	3,000	0	0	3,000
				1					: : :	1 1 0	ĺ
Project	Project 641023			Page	Page 19 of 28 Pages	ges			Exhibi	Exhibit R-3 (PE 0603851F)	33851F)

RDT&E PROGRAM ELEMENT	GRAM ELE		/PROJECT	COST BR	COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	00
BUDGET ACTIVITY  04 - Demonstration and Validation	Validation			PE NUMBER AT <b>0603851F</b>		ICBM - DEM/VAL			9	РRОЈЕСТ <b>641023</b>
(U) Performing Organizations Continued: Support and Management Organizations TRW Various Various CBM Funding (Under	Continued: rganizations SS/T&M Various	Mar 97 As Req'd	N/A Continuing	N/A Continuing	4,077	29	2,000	34	Continuing	6,106 TBD 10,907
Review) Test and Evaluation Organizations AEDC MIP Pt Magu Missile Range MIP	<u>zations</u> MIPR MIPR	Feb 98 Pending	1,000	1,000	1,000	0 0	0 1,200	0	0	1,000
(U) Government Furnished Property:  Contt  Meth  Item  OESCIPTION  Product Development Property  None  Support and Management Property	coperty: Contract Method/Type or Funding Vehicle arty roperty	Award or Obligation Date	<u>Delivery</u> Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
None Test and Evaluation Property None Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	Ly cent gement n				Total Prior to FY 1999 27,744 4,625 1,000 33,369	Budget FY 1999 0 10,936 0 10,936	Budget FY 2000 15,700 2,030 1,200 18,930	Budget FY 2001 0 34 34	Budget to Complete 0 TBD 0 TBD	Total Program 43,444 TBD 2,200 TBD
Project 641023			Pa	Page 20 of 28 Pages	ses			Exhib	Exhibit R-3 (PE 0603851F)	03851F)

	RDT&	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFIC/	TION S	SHEET (	R-2A E	xhibit)		DATE	Februa	February 2000
80DZ	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>	and Validation			PE NUMBER <b>0603851</b>	PE NUMBER AND TITLE 0603851F ICBM	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	  -  -			PROJECT <b>641024</b>
	COST (\$ ir	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
641024		ICBM Command & Control (C2) Applications	171	179	177	438	433	443	451	0	0
9	A. Mission Description	uo							:		
	To maintain the ICBN providing connectivit survivable, and secure	To maintain the ICBM weapon systems as a credible deterrent to a hostile attack requires an extremely high confidence in the command and control (C2) systems providing connectivity to the National Command Authority (NCA). To ensure the ICBMs can be tasked in all manners of hostile environments requires assured, survivable, and secure channels of communication to the missile Launch Control Centers (LCCs). While assured connectivity is mandated for ICBMs, ways must be	deterrent to a hority (NCA the missile I	a hostile atta .). To ensur .aunch Cont	ick requires e the ICBMs rol Centers	an extremely s can be task (LCCs). WI	y high conficed in all ma	dence in the nners of hos connectivity	command artile environr	deterrent to a hostile attack requires an extremely high confidence in the command and control (C2) systems hority (NCA). To ensure the ICBMs can be tasked in all manners of hostile environments requires assured, the missile Launch Control Centers (LCCs). While assured connectivity is mandated for ICBMs, ways must	32) systems es assured, ways must be
	found to make the C2 communications and missions that will evo networks, and system	found to make the C2 systems cost efficient. Continuing studies are needed to identify existing and future technologies as well as concepts that exploit state-of-the-art communications and information transfer techniques that will guarantee the required C2 support to both the current ICBM mission and those ICBM systems and missions that will evolve in the 21st century. This program funds efforts to accomplish studies, demonstrations, and tests to ensure future ICBM C2 architectures, networks, and systems evolve in a planned, orderly, and cost efficient manner while meeting the stringent requirements of nuclear command and control.	ing studies a that will gua ogram funds nd cost effic	re needed to rantee the re efforts to ac ient manner	identify ex equired C2 s ecomplish st while meeti	isting and fu upport to bo udies, demo ng the string	three technolith the current nstrations, a	logies as went ICBM mis nd tests to en nents of nuc	ll as conceptission and thousure future	s that exploid see ICBM sy ICBM C2 ar ICBM cand and control	t state-of-the-art stems and chitectures, ol.
999	EY 1999 (\$ in Thousands) \$171 Ans \$171 Tot	<u>inds)</u> Analysis of the Fiber Optic Link/Hardened Intersite Cable System (HICS) upgrade completed. Total	ık/Hardened	Intersite Ca	ble System	(HICS) upga	ade comple	ted.			
999	FY 2000 (\$ in Thousands) \$179 Stu \$179 Tot	<u>inds)</u> Study alternatives and future concepts for a command, control, and communications system architecture supporting ballistic missile applications. Total	oncepts for a	. command,	control, and	communica	ıtions systen	n architectur	e supporting	ballistic mis	ssile applications.
99	EY 2001 (\$ in Thousands) \$177 Cor	Continue to develop and refine		and concep	ts for a com	mand, contr	ol, and comr	nunications	system archi	itecture supp	alternatives and concepts for a command, control, and communications system architecture supporting ballistic
(3)	\$177	missile applications. Total									
9	B. Project Change Summary No significant changes.	ummary s.									
۵.	Project 641024			Page 2	Page 21 of 28 Pages	Se			Ex	hibit R-2A (	Exhibit R-2A (PE 0603851F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	N SHEET (F	8-2A Exh	ibit)	DATE	TE February 2000	2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM	PE NUMBER AND TITLE O603851F ICBM - DEM/VAL	DEM/VAL			PROJECT <b>641024</b>
(U) C. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000  Actual Estimate Estimate	EStimate	FY 2003 Estimate	FX 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
(U) <b>D. Acquisition Strategy</b> Studies and analyses will be accomplished. All efforts will be conducted appropriate.	will be conducted under the ICBM Prime Integration Contract unless other strategies are deemed more	'rime Integratio	on Contract un	less other strate	gies are deemed r	nore
(U) E. Schedule Profile	FY 1999	-	$\frac{\text{FY } 2000}{3}$	000	FY 2001	2001
<ul> <li>(U) Start/Complete Fiber Optics Link/HICS Upgrade Study</li> <li>(U) Future Concepts Study for Command &amp; Control (Ongoing)</li> <li>* - Completed Event</li> <li>X - Planned Event</li> </ul>		*	· *			
Project 641024	Page 22 of 28 Pages	Ø	į		Exhibit R-2A (PE 0603851F)	E 0603851F)

	RDT&E PROGRAM ELEMENT	GRAM ELE		/PROJECT (	COST BF	COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	8
∑ <b>6</b>	вирсет астилту <b>04 - Demonstration and Validation</b>	y Validation			PE NUMBI 060385	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	DEMIVAL			<b>6</b>	PROJECT <b>641024</b>
3	A. Project Cost Breakdown (\$ in Thousands)	wn (\$ in Thousand	(SI				FY 1999	666	FY 2000	Q	FY 2001
99	Contract Engineering Support Total	port					1	171	179	300	771 771
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	story and Plannin	g Informatio	n (S in Thousar	(spr						
9	Performing Organizations: Contractor or	18: Contract									
	Government Performing	Method/Type or Funding	Award or Obligation	Performing Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Product Development Organizations Alliant SS/CP	anizations SS/CPAF	Dec 99	15	15	15	0	0	0		15
	TRW (Prime)	C/CPAF	Dec 97	Continuing	Continuing	1,461	166	175	177	Continuing	TBD
	Support and Management Organizations	Organizations Various	As Reald	A/N	<b>A</b> /Z	9	v	4	C	Continuing	TBD
	Test and Evaluation Organizations	nizations	<b>-</b>							)	
E	None Covernment Eurnished Property:	Property:									
2		Contract									
	Item	Method/lype or Funding	Award or Obligation	Delivery		Total Prior	Budget	Budget	Budget	Budget to	Total
	Description	Vehicle	Date	Date		to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Product Development Property None	perty									
	Support and Management Property	Property									
	None	į									
	Lest and Evaluation Property None										
	Project 641024			Pag	Page 23 of 28 Pages	ıges			Exhib	Exhibit R-3 (PE 0603851F)	03851F)

RDT&E PROGRAM ELEMENT/PROJE	I/PROJECT COST BREAKDOWN (R-3)	WN (R-3)		DATE Fe	February 2000	9
BUDGET ACTIVITY	PE NUMBER AND TITLE	,			P	PROJECT
04 - Demonstration and Validation	0603851F ICBM - DEM/VAL	DEM/VAL			9	641024
	Total Prior	Budget	Budget	Budget	Budget to	Total
Subtotals	to FY 1999	1999 1999	FY 2000	1007 X-1	Complete	Program
Subtotal Product Development	1,476	166	175	177	TBD	TBD
Subtotal Support and Management	10	\$	4	0	TBD	TBD
Subtotal Test and Evaluation	707 +	į	7		í í	Ę
Lotal Project	1,480	1/1	1/9	//1	IBD	UBI
Project 641024	Page 24 of 28 Pages			Exhibi	Exhibit R-3 (PE 0603851F)	3851F)

	RDT&E	RDT&E BUDGET ITEM JU	STIFICA	MOIT	SHEET (	STIFICATION SHEET (R-2A Exhibit)	xhibit)		DATE	February 2000	ry 2000
BUDG 04	BUDGET ACTIVITY  104 - Demonstration and Validation				PE NUMBER 0603851	PE NUMBER AND TITLE 0603851F ICBM -	- DEMVAL				РРОЈЕСТ <b>644209</b>
	COST (\$ in Thousands)	Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644209	9 Long Range Planning (LRP)	(LRP)	2,126	2,156	2,254	2,367	2,337	2,384	2,431	Continuing	TBD
<u>(c)</u>	A. Mission Description	ū									
	The Long Range Planni technology insertion, er generated by these stud	The Long Range Planning (LRP) task analyzes ICBM systems to identify potentitechnology insertion, employment, and force structure. The studies focus on systemerated by these studies are evaluated for feasibility, system impacts, and cost		identify potes so se focus on spacts, and c	ential modif system supp ost.	ications requ ortability, op	uired to meer perability, re	t user object liability, and	ives relative I maintainab	systems to identify potential modifications required to meet user objectives relative to long term sustainmer. The studies focus on system supportability, operability, reliability, and maintainability. Options/concepts, system impacts, and cost.	systems to identify potential modifications required to meet user objectives relative to long term sustainment, . The studies focus on system supportability, operability, reliability, and maintainability. Options/concepts, system impacts, and cost.
99	EY 1999 (\$ in Thousands) \$490 Cor	lds)  Continued support of Long Range Planning tasks to include development of the Systems Options Report and update of the Logistics Program  Management Plan and the ICBM Master Plan.	nge Planning M Master Pl	g tasks to ing	clude develo	pment of the	e Systems O	ptions Repo	rt and updat	te of the Logi	stics Program
999	\$983 (3853 (582,126 (583))	Continued feasibility and life extension studies. Continued technology insertion studies. Total	xtension stu ı studies.	dies.							
99	EY 2000 (\$ in Thousands) \$500 Cor	ods)  Continue support of Long Range Planning tasks, development of the Systems Options Report, and update of the Logistics Program Management  Plan and the ICBM Master Plan	ge Planning	tasks, devel	opment of th	ne Systems (	Options Rep	ort, and upda	ate of the Lc	ogistics Progr	am Management
999	\$892 \$764 \$2,156	Continue to perform feasibility and life extension studies.  Continue to perform technology insertion studies in support of changing ICBM environments.  Total	and life extension studies. y insertion studies in suppo	ension studi tudies in su	ies. pport of cha	nging ICBM	[ environme	nts.			
99	EY 2001 (\$ in Thousands) \$510 Cor	lds) Continue support of Long Range Planning tasks, development of the Systems Options Report, and update of the Logistics Program Management Plan and the ICBM Master Plan	ge Planning n	tasks, devel	lopment of tl	he Systems (	Options Rep	ort, and upd	ate of the Lc	ogistics Progr	am Management
999	\$945 \$799 \$2,254	Continue to perform feasibility and life extension studies.  Continue to perform technology insertion studies in support of changing ICBM environments.  Total	rand life extension studies. By insertion studies in suppo	ension stud tudies in su	ies. pport of cha	nging ICBM	í environme	nts.			
<b>a</b> .	Project 644209			Page	Page 25 of 28 Pages	səs			Û	xhibit R-2A	Exhibit R-2A (PE 0603851F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (R	-2A Exh	ibit)	DATE	February 2000	000
8UD - 40	BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	ICBM - E	EM/VAL			PROJECT <b>644209</b>
9	B. Project Change Summary No significant changes.						
9	C. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000  Actual Estimate Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
3			:  -				
<u>e</u>	<b>D. Acquisition Strategy</b> Studies and analyses will be accomplished. Efforts will be conducted using contracting strategies deemed most appropriate.	contracting strat	egies deemed	most appropri	ate.		
<b>(</b> 2)	E. Schedule Profile	FY 1999	4	$\frac{\text{FY } 2000}{2}$	.000 3	EY 2001	01 3 4
<u> </u>	*  Contract Award for Annual Studies/Analyses  Program Reviews  Reports Received  * - Completed Event  X - Planned Event	*	*	*	× ×	× ×	× ×
u.	Project 644209	Page 26 of 28 Pages			4	Exhibit R-2A (PE 0603851F)	0603851F)

									LIFAC		
	RDT&E PROGRAM ELEMEN	RAM ELE		I/PROJECT C	OST BF	COST BREAKDOWN (R-3)	<b>NN (R-3)</b>			February 2000	00
800 <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	/alidation			PE NUMBER AN <b>0603851F</b>		ICBM - DEM/VAL			9	РРОЈЕСТ <b>644209</b>
(0)	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	(इक्				EV 1000	000	EV 2000		FV 2001
9	Long Range Planning Tasks						7	490	200	3 ∩	510
9	Feasibility Studies						J. \	983	892	0) 7	945
38	l echnology insertion studies Total						,2,	653 2,126	/64 2,156	+ 9	2,254
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ory and Plannin	g Informatic	on (\$ in Thousand	(ছ)						
9	Performing Organizations:										
	Contractor or	Contract		3.6	,						
	Government	Method/ Lype	Award or	Ferrorming	Froject		r r		r C	D. J. 444	F
	Activity	or Funding Vehicle	Conganon Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Product Development Organizations	izations									•
	TRW (Prime)	C/CPAF	Dec 97	N/A	N/A	322	580	1,615	468	Continuing	TBD
	TRW	SS/CPAF	Oct 95	N/A	N/A	5,359	1,312	0			6,671
	Alliant			N/A	N/A			40			40
	McCallie	SS/CR/FFP	Nov 99	N/A	N/A			128			128
	TBD	TBD	Annually	N/A	N/A				1,632	Continuing	TBD
	Support and Management Organizations	ganizations									
	TRW	C/CPAF	Oct 95	9,913	9,913	9,913	0	0			9,913
	Various	Various	Ongoing	N/A	N/A	1,783	234	373	154	Continuing	TBD
	Test and Evaluation Organizations None	ations									10. 10.
3	Government Furnished Property:	perty:									
		Contract Method/Type	Award or								
	<u>Item</u>	or Funding	Obligation	<u>Delivery</u>		Total Prior	Budget	Budget	Budget	Budget to	Total
	Description	Vehicle	Date	Date		to FY 1999	FY 1999	EY 2000	FY 2001	Complete	Program
_	Project 644209			Page	Page 27 of 28 Pages	ges			Exhibi	Exhibit R-3 (PE 0603851F)	)3851F)

RDT&E PROGRAM ELEMENT/PROJECT	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	0
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603851F ICBM - DEM/VAL	DEM/VAL			В	PROJECT <b>644209</b>
(U) Government Furnished Property Continued:  Contract  Method/Type Award or  Item or Funding Obligation Delivery  Description Vehicle Date  Product Development Property  None  Support and Management Property	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
Test and Evaluation Property  None  Subtotals  Subtotal Product Development  Subtotal Support and Management Subtotal Test and Evaluation	Total Prior to FY 1999 5,681 11,696	Budget EY 1999 1,892 234	Budget EY 2000 1,783 373	Budget EY 2001 2,100 154	Budget to Complete TBD TBD	Total Program TBD TBD
Total Project	17,377	2,126	2,156	2,254	TBD	TBD
Project 644209	Page 28 of 28 Pages			Exhibi	Exhibit R-3 (PE 0603851F)	3851F)
	044					

PE NUMBER: 0603854F

PE TITLE: Wideband MILSATCOM (Space)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	JSTIFIC	ATION	SHEET	(R-2 Ex	hibit)		DATE	February 2000	ry 2000
BUDGET <b>04 - D</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603854F Wide	AND TITLE F Wideb	and MIL	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	(Space)		
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
	Total Program Element (PE) Cost	65,242	50,277	134,029	128,814	52,036	96,570	304,239	1,906,737	2,859,821
642679	Global Broadcast Service (GBS) Phases 1 and 2	64,573	45,367	30,206	32,566	25,529	16,973	15,640	40,237	392,968
644811	Wideband Gapfiller	699	4,910	92,323	82,948	2,107	1,637	1,937	0	186,531
644812	Advanced Wideband	0	0	0	0	0	31,360	260,762	1,866,500	2,158,622
644870	Command & Control System Consolidated (CCSC)	0	0	11,500	13,300	24,400	46,600	25,900	0	121,700
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

#### Notes.

- 1. The GBS program cost and schedule are currently being rebaselined due to additional technical issues which occurred since the 6 month slip identified in the Feb 1999
- 2. BPAC 644870 has been added to this PE for MILSATCOM Command and Control System Consolidated (CCS-C) which is a FY01 new start effort.

## (U) A. Mission Description

Provide DoD with high data rate (wideband) MILSATCOM services in accordance with the Joint Requirements Oversight Council (JROC), Joint Space Management Board approved MILSATCOM Architecture (Aug 96), and the MILSATCOM Capstone Requirements Document (CRD) approved by the JROC in Oct 97.

worldwide, limited capability at military frequencies hosted on the last three Navy Ultra High Frequency follow-on satellites. GBS Phase 2 space segment was complete Global Broadcast Service (GBS) will provide efficient, high data rate broadcast capability between many distributed information sources and warfighters who receive the broadcast directly on small, inexpensive user terminals. Broadcast data includes digitized imagery, logistics and weather data, maps, operational orders and video. with UFO 10 launch in Nov 1999. Phase 3 will provide a global capability integrated into a conceptual Advanced Wideband System. The Air Force was designated The GBS program was established as a three-phase program that was approved by the JROC in late 1995. Phase I was started in 1996 and uses commercial satellite leases to provide a Continental United States (CONUS)-based testbed for requirements definition and operational concept refinement. Phase 2 provides a near executive agent for the GBS Program by USD(A&T) on 27 Mar 1996.

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Exhibit R-2 (PE 0603854F)

	RDT&E BUDGET ITEM JUSTIFICATIO	STIFICATION SHEET (R-2 Exhibit)	(t)	DATE February 2000	
8000 <b>04</b> -	вирвет астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	MILSATCOM (\$	Space)	
9	A. Mission Description Continued  The JROC approved the OSD-led transition to implement the MILSATCOM architecture in Sept 97. The transition includes 3 Wideband Gapfiller satellites to be launched in 2004/5. The Wideband Gapfiller System is intended to minimize the probability of a gap in wideband service between current and follow-on systems, and to incorporate the best commercial technology and practices available at the time. A worldwide constellation of Advanced Wideband satellites with launches starting in 2008 will replace current wideband systems and incorporate the latest in commercial capabilities. Both programs will include a broadcast space segment (GBS Phase 2 compatible, on Wideband Gapfiller; GBS Phase 3 on Advanced Wideband). The Command and Control System-Colsolidated (CCS-C) provides an integrated commercial-based command and control system for the MILSATCOM satellite constellations. This is a new start in FY01.	intended to minimize the probability of a gap in wideband service between current and follow-on systems, and es available at the time. A worldwide constellation of Advanced Wideband satellites with launches starting in orate the latest in commercial capabilities. Both programs will include a broadcast space segment (GBS Phase dvanced Wideband). The Command and Control System-Colsolidated (CCS-C) provides an integrated MILSATCOM satellite constellations. This is a new start in FY01.	nsition includes 3 W band service betweer f Advanced Wideban rams will include a by tem-Colsolidated (CC start in FY01.	ideband Gapfiller satellites to a current and follow-on system d satellites with launches start roadcast space segment (GBS CS-C) provides an integrated	be is, and to ing in Phase 2
9	<b>B. Budget Activity Justification</b> (U) Funding is in Budget Activity 4, Demonstration and Validation, since it supports Global Broadcast Service technology demonstration and validation.	it supports Global Broadcast Serv	ice technology demor	nstration and validation.	
9	C. Program Change Summary (\$ in Thousands)				
	(and once the contract of the	EY 1999	EY 2000		Total Cost
3 (	rrevious rresidents buaget (r. 1. 2000 f.b.k.) Amnonriated Value	70.147	50,344	7,100	2,337,200
3	Adjustments to Appropriated Value		· · · · · · · · · · · · · · · · · · ·		
`	a. Congressional/General Reductions	-771	-67		
	b. Small Business Innovative Research	-398			
	c. Omnibus or Other Above Threshold Reprogram				
	d. Below Threshold Reprogram	1,959			
	e. Rescissions f Other	-5,695			
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR	65,242	50,277	36,273 134,029 2	2,859,821
9	Significant Program Changes: (U) \$1,959K FY99 reprogramming funded receive suites supporting transition from the Bosnia Command and Control Augmentation to GBS.	ition from the Bosnia Command ar	nd Control Augmenta	tion to GBS.	
	(U) \$36,273K FY01 increase fully funded WGS non-recurring engineering efforts.	efforts.			
	(U) FY02-05 funding for one WGS satellite was realigned from RDT&E to the Missile Procurement appropriation.	o the Missile Procurement appropr	iation.		
	Pa	Page 2 of 20 Pages		Exhibit R-2 (PE 0603854F)	854F)

	RDT&E BUDGET ITEM JUSTIFICAT	STIFICATION SHEET (R-2 Exhibit)	DATE February 2000
B	вирсет астилту <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	pace)
<b>(3</b> )	C. Program Change Summary (\$ in Thousands) Continued		
<u>(C</u>	Significant Program Changes Continued: (U) The total PE cost increased due to the above adjustments as well as, revised outyear estimates for the Advanced Wideband System.	s, revised outyear estimates for the Advanced Wideband Sys	stem.
		Page 3 of 20 Pages	Exhibit R-2 (PE 0603854F)
L			

	RDT&E BUDGET ITEM JU	STIFIC/	ATION S	STIFICATION SHEET (R-2A Exhibit)	R-2A E	khibit)		DATE	February 2000	y 2000
BUDGET ACTIVITY <b>04 - Demons</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603854F Widel	AND TITLE F Wideb	and MIL	PENUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	l (Space)		PROJECT <b>642679</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
642679	Global Broadcast Service (GBS) Phases 1 and 2	64,573	45,367	30,206	32,566	25,529	16,973	15,640	40,237	392,968

Note: The GBS program cost and schedule are currently being re-baselined due to additional technical issues which occurred since the 6 month slip identified in the Feb 99 SAR.

#### A. Mission Description 3

Requirements Oversight Council in Apr 1995. Broadcast data includes digitized imagery, logistics and weather data, maps, operational orders (e.g., Air Tasking Order), will receive the broadcast directly on small, inexpensive user terminals in accordance with the GBS Operational Requirements Document (ORD) validated by the Joint Acquires phases 1 and 2 of the GBS program to provide DoD with efficient, high data rate connectivity to many distributed information sources and warfighters who management, uplink and receive equipment. The GBS Phase 2 space segment was complete with the UFO 10 launch in Nov 1999. This ground infrastructure works and video. Phase 1 is a single channel leased through FY98 for initial testing and concept exploration. Phase 2 is the initial ground infrastructure for broadcast with GBS packages hosted on three Navy UHF Follow-on (UFO) satellites providing near-worldwide service.

System Development and Test	Initial Comm Connectivity/Interface, CONUS Transponder Lease
J) \$33,187	(U) \$6,652
9	9

Phase 2 Government System Integration Field Survey and Integration \$17,299 \$654 9

System Test & Evaluation Support Navy Terminals \$6,000 \$781 99

Total \$64,573 3

#### FY 2000 (\$ in Thousands) 56

System Development and Test	Initial Comm Connectivity/Interface, CONUS Transponder Lease	Phase 2 Government System Integration	Field Survey and Integration	Navy Terminals	System Test & Evaluation Support
\$13,103	\$6,743	\$15,416	\$109	\$6,000	\$782
9	3	9	9	9	9

System Test & Evaluation Support \$782

Joint Terminals Engineering Office (JTEO) Support \$3,214

Project 642679

Page 4 of 20 Pages

Exhibit R-2A (PE 0603854F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	M JUSTIFI	CATION	SHEET (F	3-2A Exh	ibit)	Dγ	DATE February 2000	, 2000
BUDC <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603854F Widel	AND TITLE  Widebar	d MILSAT	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	(e)	PROJECT <b>642679</b>
(D)	A. Mission Description Continued								
99	FY 2000 (\$ in Thousands) Continued \$45,367 Total								
555555	\$12,968 System Development and Test \$12,968 System Development and Test \$3,555 Initial Comm Connectivity/Interface, CONUS Trasnsponder Lease \$7,106 Phase 2 Government System Integration \$6,000 Navy Terminals \$5,77 System Test and Evaluation Support \$30,206 Total	nd Test vity/Interface, C /stem Integratic ition Support	ONUS Trasns n	ponder Lease					
<u>(</u>	<b>B. Project Change Summary</b> (U) \$1,959K FY99 reprogramming funded receive suites supporting transition from the Bosnia Command and Control Augmentation to GBS	eive suites supp	oorting transitie	on from the Bo	snia Command	l and Control	Augmentation t	o GBS	
9	C. Other Program Funding Summary (\$ in Thousands)  FY 1999  FY 2000  Actual Estimate	Thousands) EY 2000 Estimate	EX 2001 Estimate	FY 2002 Estimate	EY 2003 Estimate	EX 2004.	FY 2005 Estimate	Cost to Complete	Total Cost
£££ £ £ £	Related RDT&E: None Other APPN Air Force GBS receive terminals. Included in BPAC 836780, line P-67 PE 33601, Milstar Satellite Comm Sys, Other Procurement, AF Navy SATCOM Ship Terminal Programs Army Ground Terminal Programs Navy UFO Program								
<b>D</b>	Project 642679		Pag	Page 5 of 20 Pages				Exhibit R-2A (PE 0603854F)	E 0603854F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	N JUS	STIFIC	SATION	SHEET	(R-2A E	xhibit			DATE	Febru	February 2000	000	
80D <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation				PE NUMB <b>06038</b> 5	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	band M	IILSAT	COM (§	Space)			PROJECT <b>642679</b>	<sub>⊢</sub> 6
(£)	C. Other Program Funding Summary (\$ in Thousands)  EY 1999  EY 2000  Actual Estimate	n Thousands) FY 2000 Estimate	usands) 27 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate		FY 2004 Estimate	FY 2005 Estimate	건 31 1	Cost to Complete	୍ ଅ	Total Cost	Cost
6	Command and Control Augmentation Program (BC2A) and Joint Broadcast Service (JBS) ARPA Battlefield Awareness and Data Dissemination (BADD) Advanced Concept													
5	Technical Demonstration (ACTD) DISA Long Haul Communications													
9	D. Acquisition Strategy  (U) Evolutionary acquisition approach making maximum use of commercial technology and acquisition practices. Single integration contractor with total system performance responsibility. (Navy providing space segment for Phase 2 and adapting common receive terminal equipments for shipboard installation.)	ng maximu g space se	ım use of gment fo	f commercial r Phase 2 anc	technology I adapting co	and acquisiti ommon recei	on practic ve termina	es. Singlati	e integrati ents for sl	ion contr 1ipboard	actor with installativ	h total sy on.)	/stem	
<u>e</u>	E. Schedule Profile			_	EY 1999	92 °,	-	EY 2000	000 **	4	_	EY 2001		4
5555	Phase 1 (96-98) Joint Warfighter Interoperability Demos Lease Commercial Transponder Phase 2 (98-00+)	(JWID)		*	ı *		*	×	×	×	×			×
333	Aquisition Milestone I/II (Nov 98) Launch UFO #8 (Mar 98)			*										
9999	Launch UFO #9 (Oct 98) Launch UFO #10 (Nov 99) Initial Operational Capability Milestone III			*			*			××				
	Project 642679			Pag	Page 6 of 20 Pages	ges				Ш	Exhibit R-2A (PE 0603854F)	2A (PE (	603854	Ē.

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (R-2A Exhibit)	DATE February 2000
вирсет астіvіту <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	PROJECT <b>642679</b>
(U) E. Schedule Profile Continued	FY 1999 FY 2000 2 3 4 1 2 3	FY 2001 4 1 2 3 4
* = Completed Event X = Planned Event		
Project 642679	Page 7 of 20 Pages	Exhibit R-2A (PE 0603854F)

	DOTA E DECEMBAN EL EMEN	E E	MENT/PI	L/PRO IECT C	OST RE	COST RREAKDOWN (R-3)	VN (R-3)		DATE	Eobrise, 2000	٤
2	OCT ACTIVITY				DE NI IMBE	DE NI IMBER AND TITIE			-	a dina	PRO JECT
<b>0</b>	BUDGET ACTIVITY 04 - Demonstration and Validation	alidation			060385	0603854F Wideband MILSATCOM (Space)	and MILSA	TCOM (S)	pace)	Ý	642679
(D)	A. Project Cost Breakdown (\$ in Thousands)	§ in Thousand	[8]				)1 /84	o	00c XI		EV 2001
(I)	System Develonment and Test						33.187	₹] ‰	13,103	<b>.</b>	12,968
9	Communication Connectivity/Interface	Interface					6,652	52	6,743		3,555
3	Phase 2 Government System Integration	ntegration					17,299	66	15,416		7,106
<u> </u>	Field Survey and Integration						6 6.0	654 6.000	109 6.000		000.9
333								781	3,214		577
9							64,5/3	5/2	45,367		30,206
<u>e</u>	B. Budget Acquisition History and Planning Information (\$ in Thousands)	y and Plannin	g Informatio	n (\$ in Thousan	ds)						
ව	Performing Organizations: Contractor or Government	Contract Method/Type	Award or	Performing	Project						
		or Funding Vehicle	Obligation Date	Activity	Office	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Development Organiz	ations								•	
	ı	CPAF	18 Nov 97	124,782	124,782	58,855	33,187	19,103	12,968	44,424	168,537
	Support and Management Organizations Vorigina	various anizations Vorious	Various	A/N	V V	24,001	17,221	12,638	5 867	49 409	107,612
	न्न	ions	Vorions		Y/N	10,01	781	787	577	766	3.013
	Support for Development & Operational Test	v ar rous	v al lous	Y)N	Ç.	6	107	70.		8	,
<u>e</u>	Government Furnished Property:	contract	•								
	Item Description	Method/1ype or Funding Vehicle	Award or Obligation Date	Delivery Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Project 642679			Pag	Page 8 of 20 Pages	ges			Exhibi	Exhibit R-3 (PE 0603854F)	03854F)
								=			

BUDGET ACTIVITY  O4 - Demonstration and Validation  (U) Government Furnished Property Continued:  Contract  Method/Type Award or  Item  OF ENUMBER AND TITLE  OG03854F Wideband MII  Contract  Method/Type Award or  Method/Type Obligation  Description  Vehicle  Date  Date  Date  FY 1999  FY 1997  TBD	I/PROJECT COST BREANDOWN (R-S)	<u>.</u>	February 2000	_
Government Furnished Property Continued:         Contract         Method/Type       Award or Method/Type       Delivery       Total Prior         Description       Vehicle       Date       to FY 1999         Product Development Property       TBD	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	Space)	PR <b>64</b>	PROJECT <b>642679</b>
Support and Management Property TBD	Total Prior Budget Budget to FY 1999 FY 1999 FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
Test and Evaluation Property         Total Prior         Budge           TBD         to FY 1999         FY 199           Subtotal Subtotal Product Development         93,456         52,40           Subtotal Support and Management         28,314         11,38           Subtotal Test and Evaluation         107         78           Total Project         121,877         64,57	Total Prior         Budget to FY 1999         EY 1999         FY 2000           93,456         52,408         31,947           28,314         11,384         12,638           107         781         782           121,877         64,573         45,367	Budget EY 2001 23,762 5,867 577 30,206	Budget to Complete 80,770 49,409 766	Total Program 282,343 107,612 3,013 392,968
Project 642679 Pages	1ges	Exhib	Exhibit R-3 (PE 0603854F)	3854F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	STIFIC/	VIION 8	SHEET (	R-2A E	xhibit)		DATE	Februa	February 2000
BUDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AN 0603854F	PE NUMBER AND TITLE 0603854F Widek	and Mil	SATCON	Wideband MILSATCOM (Space)		РРОЈЕСТ <b>644811</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644811	1 Wideband Gapfiller	699	4,910	92,323	82,948	2,107	1,637	1,937	0	186,531
E)	A. Mission Description Provide wideband communications to continue the Defense Satellite Communications System (DSCS) X-Band connectivity. Wideband Gapfiller will also provide a new point-to-point service using the Ka-band frequency, and will host a broadcast capability similar to GBS Phase 2. Launches are scheduled for FY2004/5 and the three satellite constellation will use maximum commercial practices and technology.	efense Satell ncy, and will ercial practic	ite Commui host a broac es and techi	nications Systcast capabil	stem (DSCS ity similar te	X-Band co GBS Phase	nnectivity.	Wideband G es are sched	apfiller will uled for FY	fense Satellite Communications System (DSCS) X-Band connectivity. Wideband Gapfiller will also provide a y, and will host a broadcast capability similar to GBS Phase 2. Launches are scheduled for FY2004/5 and the cial practices and technology.
999	FY 1999 (\$ in Thousands) \$669 Conduct Studies to Investigate   \$669 Total		nternational Cooperation	uo						
555	FY 2000 (\$\\$\times\) in Thousands) \$4,910 Began Pre-Engineering and Manufacturing Development (EMD) \$4,910 Total	lanufacturing	Developme	ent (EMD)						
55555	FY 2001 (\$\subseteq\$ in Thousands) \$82,536 Begin EMD (Satellite Design) following competitive contract award \$3,310 JTEO Support \$6,477 Program Support \$92,323 Total	following c	ompetitive c	confract awa	<del>p</del> .					
9	B. Project Change Summary (U) \$36,273K FY01 increase funded WGS non-recurring engineering efforts.	ring enginee	ring efforts.							
	(U) FY02-FY05 funding for one WGS satellite was realigned from RDT&E to the Missile Procurement appropriation.	ealigned fro	n RDT&E t	o the Missil	e Procureme	nt appropria	tion.			
Pr	Project 644811		Page	Page 10 of 20 Pages	ses		į	Û	thibit R-2A	Exhibit R-2A (PE 0603854F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	GET ITEN	A JUSTIFI	CATION	SHEET (	R-2A Exi	hibit)		DATE <b>Februa</b>	February 2000	
BUE <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	idation			PE NUMBER AND TITLE 0603854F Widel	AND TITLE F Wideba	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	TCOM (Sp	ace)	PROJECT <b>644811</b>	
<b>(</b> 2)	C. Other Program Funding Summary (\$ in Thousands)  EY 1992 EY 2000  Actual Estimate	mmary (\$ in 7 FY 1999 Actual	Chousands) EX 2000 Estimate	EY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	EY 2005 Estimate	Cost to Complete	Total Cost	ost
9		0	0	25,736	391,753	205,720	50,898	12,217	154,252	840,576	9/
9	AF Wideband 3080 Procurement (CCS-C), PE	0	0	4,852	5,411	5,503	8,115	2,209	0	26,090	06
<u>(</u>		0 her Procuremer	0 nt, AF	11,500	13,300	24,400	46,600	25,900	0	121,700	06
9	D. Acquisition Strategy Procure Gapfiller system making maximum use of commercial technology and practices by modifying commercial satellites to support unique military requirements.	ş maximum use	e of commercia	l technology a	nd practices by	modifying c	ommercial sate	ellites to supp	ort unique military	requirements.	
9	E. Schedule Profile			1	FY 1999 2 3	4	$\frac{FY}{1}$	FY 2000 2 3 ,	_	FY 2001 2 3 4	
<u> </u>	Defense Acquisition Board Prep EMD/Production Contract Award EMD 1st of 3 launches (1QFY04) x = planned event	P P					*	×	× ×× ×	× ×	
	Project 644811			Pago	Page 11 of 20 Pages	Š			Exhibit R-2A	Exhibit R-2A (PE 0603854F)	
					103						

	RDT&E PROGRAM ELEMENT	RAM ELE	MENT/P	I/PROJECT COST BREAKDOWN (R-3)	OST BF	REAKDON	VN (R-3)		DATE <b>Fe</b> l	February 2000	00
BUD. <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	/alidation			PE NUMBE 060385	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	and MILSA	TCOM (S	pace)	9	РРОЈЕСТ <b>644811</b>
9	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	<u>(s)</u>				FV 1000	000	FV 2000		FV 2001
55555	Conduct Studies to Investigate International Cooperation EMD Activities JTEO Support Program Support Total	te International (	Cooperation					699 0 0 0 699	4,910 0 0 0 0 0 0		0 82,536 3,310 6,477
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannin	g Informatio	n (S in Thousanc	(\$1						
Ð	Performing Organizations: Contractor or Government Performing Activity	Contract Method/Type or Funding Vehicle	Award or Obligation Date	Performing Activity EAC	Project Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	TBD (WGS Satellites) TBD	zanons TBD	TBD	TBD	TBD	0	0	0	82,536	79,169	161,705
	Support and Management Organizations JTEO PR	ganizations PR	Continuing	3,310	3,310	0	0	0	3,310	0	3,310
	Pre-EMD International Studies	Form 277 SS/CFFF/AF	Dec 99 Various	5,579	5,579	0	699 0	4,910 0	00	00	4,910 669
	Program Support  Test and Evaluation Organizations AFOTEC, DT&E TBI	TBD ations TBD	TBD TBD	TBD	TBD	0	0	0	6,477	9,460	15,937
9	Government Furnished Property:  Cont Meth Item or Fu  Description Vehi Product Development Property TBD	perty: Contract Method/Type or Funding Vehicle	Award or Obligation Date	<u>Delivery</u> <u>Date</u>		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
т.	Project 644811			Page	Page 12 of 20 Pages	Ses			Exhibi	Exhibit R-3 (PE 0603854F)	03854F)

RDT&E PROGRAM ELEMENT/PROJE	//PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	00
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	nd MILS	ATCOM (S	pace)	9 9	РКОЈЕСТ <b>644811</b>
<ul> <li>(U) Government Furnished Property Continued:</li> <li>Support and Management Property</li> <li>TBD</li> <li>Test and Evaluation Property</li> <li>TBD</li> </ul>						
Subtotals Subtotal Product Development Subtotal Support and Management	<u>Total Prior</u> to FY 1999 0	Budget FY 1999 0 669	Budget FY 2000 0 4,910	Budget FY 2001 82,536 9,787	Budget to Complete 79,169 9,460	Total Program 161,705 24,826
Subiolai Test and Evaluation Total Project	0	699	4,910	92,323	88,629	186,531
Project 644811	Page 13 of 20 Pages			Exhibi	Exhibit R-3 (PE 0603854F)	3854F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	TEM JU	STIFIC,	ATION (	SHEET (	R-2A E	xhibit)		DATE	February 2000	رم 2000
BUDC	BUDGET ACTIVITY	<b> </b>			PE NUMBER	PE NUMBER AND TITLE	IIM Puc	SATCOR	PE NUMBER AND TITLE DE028EAE WINGSPACE MILEATCOM (Space)		PROJECT <b>644812</b>
<u>.</u>	COST (\$ in Thousands)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644812	12 Advanced Wideband		0	0	0	0	0	31,360	260,762	1,866,500	2,158,622
9	A. Mission Description The Advanced Wideband System will provide follow-on DSCS/Wideband Gapfiller communications services starting in FY 2008. It will continue or replace DSCS X-band, Wideband Gapfiller Ka-band services, and will also include the GBS Phase 3 broadcast space segment. The constellation will provide worldwide coverage and make maximum use of commercial practices and technologies.	ovide follow vices, and w ices and tech	on DSCS/vill also inch	Wideband Gr	apfiller com	munications adcast space	services star	rting in FY ? The constell:	2008. It will ation will pr	l continue or ovide worldv	replace DSCS vide coverage and
999	FY 1999 (\$ in Thousands) \$0 Not Applicable \$0 Total										
999	FY 2000 (\$ in Thousands) \$0 Not Applicable \$0 Total										
999	FY 2001 (\$ in Thousands) \$0 Not Applicable \$0 Total										
9	<b>B. Project Change Summary</b> (U) Revised outyear estimates for the Advanced Wideband System increased the PE total cost.	vanced Wide	eband Syste	m increased	the PE total	cost.					
<b>9 9 9</b>	C. Other Program Funding Summary (\$ in Thousands)  EX 1999 FY 2000  Actual Estimate AF Terminals in PE 33601F, Other Procurement, AF Navy terminals in other PEs Army terminals in other PEs	S in Thousa 29 EY. ual Est		EX 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	Extimate Estimate		Extimate	Cost to Complete	Total Cost
<u>.</u>	Project 644812	•		Page	Page 14 of 20 Pages	sə'			û	xhibit R-2A (	Exhibit R-2A (PE 0603854F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	SHEET (R-2A Exhibit)	Е February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PENUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	PROJECT <b>644812</b>
(U) D. Acquisition Strategy Provide Advanced Wideband capability, making maximum use of commercial technology and practices.	technology and practices.	
(U) E. Schedule Profile	X 200	X 200
(U) 1st launch in 1QFY09	2 3 4 1 2 3 4	1 2 3 4
Project 644812 Page	Page 15 of 20 Pages	Exhibit R-2A (PE 0603854F)

	RDT&E PROGRAM ELEMENT	RAM ELE		/PROJECT COST BREAKDOWN (R-3)	OST BF	REAKDOV	VN (R-3)		DATE Fe	February 2000	8
BG <b>8</b>	вирсет аститт <b>04 - Demonstration and Validation</b>	alidation			PE NUMBI 060385	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	ind MILS	TCOM (S	pace)	<b>.</b>	PROJECT <b>644812</b>
(D)	A. Project Cost Breakdown (\$ in Thousands)	S in Thousanc	(SI				EV 1000	000	EV 2000	Ç	EV 2001
99	Not Applicable Total							0 0		300	0
<u>e</u>	B. Budget Acquisition History and Planning Information (\$ in Thousands)	y and Plannin	g Informatio	n (\$ in Thousand	গ্ৰে						
9	Performing Organizations: Contractor or	Contract									
	Government N Performing G	Method/Type or Funding	Award or Obligation	Performing Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity	Vehicle	<u>Date</u>	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	TBD TBD TBD TBD	TBD	TBD	TBD	TBD						
	Support and Management Organizations TBD	anizations TBD	TBD	TBD	TBD						
	Test and Evaluation Organizations TBD	ions TBD	TBD	TBD	TBD						
9	Government Furnished Prop	erty:									
		Method/Type	Award or	÷						:	
	Item C Description	or Funding Vehicle	Obligation Date	<u>Delivery</u> Date		Total Prior to FY 1999	Budget FY 1999	FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	velopment Propert			G						007 031 0	000000000000000000000000000000000000000
	Description of Description	IBU	IBD	150						7,130,022	7,130,022
	Support and Management Property TBD TBI	TBD	TBD	TBD							
	Test and Evaluation Property TBD	TBD	TBD	TBD							
	Project 644812			Page	Page 16 of 20 Pages	ges			Exhibi	Exhibit R-3 (PE 0603854F)	03854F)

RDT&E PROGRAM ELEMENT/PROJECT C	/PROJECT COST BREAKDOWN (R-3)	VN (R-3)		DATE <b>Fe</b>	February 2000	00
BUDGET ACTIVITY  10.4 - Demonstration and Validation	PE NUMBER AND TITLE  10603854F Widehand MII SATCOM (Space)	75 IIM pu	S) MOST		id y	PROJECT 644812
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001		Total Program 2,158,622
Total Project					2,158,622	2,158,622
Project 644812	Page 17 of 20 Pages			Exhibi	Exhibit R-3 (PE 0603854F)	03854F)

	RDT&E BUDGET ITE	Ĭ N N	STIFIC/	ATION (	ITEM JUSTIFICATION SHEET (R-2A Exhibit)	(R-2A E	xhibit)		DATE	Februa	February 2000
BUD( <b>04</b> -	BUDGET ACTIVITY   04 - Demonstration and Validation				PE NUMBER 0603854	PE NUMBER AND TITLE 0603854F Widel	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	SATCON	l (Space)		PROJECT <b>644870</b>
	COST (\$ in Thousands)		FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644870	70 Command & Control System Consolidated (CCSC)	csc)	0	0	11,500	13,300	24,400	46,600	25,900	0	121,700
9	A. Mission Description  The MILSATCOM Command Control System-Consolidated (CCS-C) will competitively procure integrated launch and on-orbit command control functionality for MILSATCOM satellites as the sustainment contract for the current capability funded under PE 0305110F (AFSCN) completes according to plan. CCS-C will use modified commercial off the shelf hardware/software to control all emerging and legacy MILSATCOM systems (six different constellations). It will support the finnew system to need CC (Wideband Gapfiller), and will provide reduced operating and maintenance costs.	m-Consolontract fo	lidated (CC or the currer to control a	S-C) will contract to the contract of the cont	ompetitively funded und and legacy N ating and ma	procure inte er PE 03051 MILSATCO uintenance co	egrated launc 10F (AFSC) M systems (;	h and on-orl V) completes six different	oit command s according t constellation	l control functo plan. CC ns). It will s	lidated (CCS-C) will competitively procure integrated launch and on-orbit command control functionality for or the current capability funded under PE 0305110F (AFSCN) completes according to plan. CCS-C will use to control all emerging and legacy MILSATCOM systems (six different constellations). It will support the first Il provide reduced operating and maintenance costs.
	CCS-C is an FY01 new start effort. The Air Force is demonstration phase in 4QFY00.		oreparing a	\$2.5M FY(	00 new start	reprogramm	iing action fc	or Congressi	onal approva	al to initiate	preparing a \$2.5M FY00 new start reprogramming action for Congressional approval to initiate a competitive
999	FY 1999 (\$ in Thousands) \$0 No Activity \$0 Total										
<u> </u>	FY 2000 (\$ in Thousands) \$0 No Activity \$0 Total										
99999	FY 2001 (\$ in Thousands)  \$8,120 Demonstration \$1,200 Development \$2,180 Program Support \$11,500 Total										
<u>e</u>	B. Project Change Summary (U) None.										•
О.	Project 644870			Page	Page 18 of 20 Pages	sə.			Ä	thibit R-2A (	Exhibit R-2A (PE 0603854F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit)	TEM JUSTIF	-ICATION	SHEET (	3-2A Exh	nibit)	νO	DATE February 2000	, 2000
BUE <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AND TITLE 0603854F Widel	AND TITLE - Widebar	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	COM (Spa		PROJECT <b>644870</b>
<u>(</u>	C. Other Program Funding Summary (\$ in Thousands)  FY 1999  FY 2000  Actual  Estimate	\$ in Thousands) 99 FY 2000 ual Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	EX 2005 Estimate	Cost to Complete	Total Cost
555555	AF RDT&E PE 33110, DSCS PE 64479, Milstar PE 63430, AEHF Other APPN AF Wideband 3080 Procurement (CCS-C), PE 33600F		4,852	5,411	5,503	8,115	2,209	0	26,090
3	D. Acquisition Strategy A competitive demonstration phase, with a mix of fixed-price and cost-plus contract line items, will be awarded in 4QFY00 pending approval of the FY00 New Start reprogramming request. The fixed price contract options will support a 4QFY01 contractor down select for the development phase.	a mix of fixed-pric ontract options wil	e and cost-plus o	contract line ite	ms, will be aw down select fc	varded in 4QF or the developn	Y00 pending ay	pproval of the FY $0$	00 New Start
9	E. Schedule Profile		1	EY 1999 2 3	4	EY 2000	2000 3 4	EY 2001	2001 3 4
<u> </u>	Contract Award Prototype/Demonstration Option to Proceed Development Phase						×	×	×××
	Project 644870		Page	Page 19 of 20 Pages	Ş			Exhibit R-2A (PE 0603854F)	E 0603854F)

	RDT&E PROGRAM ELEMENT	MENT/PROJECT		ST BR	COST BREAKDOWN (R-3)	/N (R-3)		DATE Fe	February 2000	8
80D <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBE 060385	PE NUMBER AND TITLE 0603854F Wideband MILSATCOM (Space)	nd MILSA	TCOM (S	pace)	<u>.</u>	РКОЈЕСТ <b>644870</b>
(c)	A. Project Cost Breakdown (\$ in Thousands)	(SI				EV 1000	000	EV 2000		EV 2001
5	Demonstration						7 0	0	<b>.</b>	8.120
3	Development						0	0		1,200
99	Program Support Total						0 0	0		2,180 11,500
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	g Information (\$ i	n Thousands)							
9	Performing Organizations: Contractor or									
	Government Method/Type Performing or Funding	Award or Pe	Performing Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	velonment Organiz	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	TBD	TBD	TBD	TBD	0	0	0	8,120	0	8,120
	TBD	TBD	TBD	TBD	0	0	0	1,200	100,600	101,800
	Support and Management Organizations	11.			c	c	Ċ	•		000
	Aerospace TBD	various Various	TBD	TBD	>	0	>	7,180	9,600	11,780
	Test and Evaluation Organizations									
					Total Prior	Budget	Budget	Budget	Budget to	Total
	Subtotals				to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Subtotal Product Development				0 0	0	0 0	9,320	100,600	109,920
	Subtotal Support and Management				0	•	-	7,180	3,600	11,/80
	Total Project				0	0	0	11,500	110,200	121,700
	04070		)C 220	Cod Octo	Ş			ָ װ֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֖֭֭֭֭֭֭֭֭֡֡֡֡֡֡֡֡֡֡	90 30/ c a t	(30545)
	Project 644870		rage 20	rage 20 of 20 rages	ses.			EXUIDI	EXNIBIT K-3 (PE UDU3854F)	J3854F)

RDT&E BUDGET ITEM JU	USTIFIC	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	February 2000	y 2000
BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER 0603856  (AFNPC)	PE NUMBER AND TITLE 0603856F AIr Fo (AFNPC)	rce/Natio	onal Proç	ıram Co	PE NUMBER AND TITLE 0603856F Air Force/National Program Cooperation (AFNPC)	РРОЈЕСТ <b>644782</b>
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644782 AF/NRO Partnership	2,033	0	3,370	4,415	8,809	3,330	0	0 Continuing	TBD
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0

Note: The AF/NRO Partnership PE, 0603856F, was an FY 1999 new start. Congress directed its merger with the National Security Space Architect (NSSA) in FY 2000 into a new entity entitled 'AF/National Program Cooperation (AFNPC)'. FY 2000 AFNPC funding was executed in PE 0305917F. In FY 2001 the NSSA moves to a defense-wide PE (number TBD); remaining AFNPC funding moves to this PE, 0603856F. These efforts are not new starts.

# U) A. Mission Description

- (U) Air Force/National Program Cooperation (AFNPC) provides resources to identify areas for Air Force cooperative space efforts with the intelligence community (IC) partnership between the Air Force and the IC will help to revolutionize and operationalize space in the 21st century. AFNPC currently supports two efforts, which both and to conduct joint AF-IC demonstrations, operations, resource assessments, and space activities. AFNPC efforts result in low-cost, high-benefit enhancements to existing programs, thereby enabling key improvements to space and space-related capabilities; they also prevent duplication of efforts, creating cost savings. Better began in FY 1999 under the aegis of the AF/NRO Partnership, PE 0603856F: 1) the AF/NRO Integration Planning Group and 2) the SBIRS TI project.
- acquisition, and resources are submitted to HQ USAF and NRO staffs and leadership for mutual agreement and implementation. Past, present, and future initiative areas (U) The AF/NRO Integration Planning Group (ANIPG) engenders greater AF-NRO synergies in R&D, operations, and programs by developing options for increasing surveillance, and reconnaissance (ISR) assets. ANIPG efforts are key facilitators for enhancing AF and NRO capabilities and increasing the cost-effectiveness of AF integration across the entire range of AF and NRO space activities. ANIPG-developed recommendations on policy, plans, programs, requirements, architectures, include precision targeting, communications, combat identification, joint acquisition, and reduction in operations personnel tempos for airborne intelligence, and NRO space efforts.
- SBIRS requirements for theater missile defense, technical intelligence, and battlespace characterization. Specifically, the project assists in satisfying SBIRS Operational (U) The Space-Based Infrared System Technical Intelligence (SBIRS TI) project develops processing capabilities to exploit SBIRS High sensor data for the technical remote ground stations and B) integrating SBIRS data with other intelligence source data. TI is a militarily-significant mission: obtained data are used to maximize Requirements Document threshold requirements for real-time technical intelligence by A) developing a backup center for remotely-controlled TI pre-processing at intelligence mission. These enhancements will provide data extraction, processing, exploitation, and sensor cross-cueing capabilities needed to meet fundamental operational weapons system effectiveness by optimizing detection, classification/typing, and negation capabilities for warning and active defense systems.

Project 644782

Page 1 of 6 Pages

	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)	it)	DATE February 2000	2000
8UD <b>04</b> .	вирсет астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603856F Air Force/National Program Cooperation (AFNPC)	National Progra	ım Cooperation	РРОЈЕСТ <b>644782</b>
(C)	A. Mission Description Continued				
	(U) The intelligence community matches Air Force FY or aggregate FYDP funds for the joint projects funded through this PE. IC funds are reported in Intelligence Program Objective Memorandum (IPOM) submissions.	unds for the joint projects fund	ed through this PE. IC	C funds are reported in I	ntelligence
3333	EX 1999 (\$ in Thousands) \$825 Technical support to the AF/NRO Integration Planning Group (ANIPG) \$1,208 Developing processing capabilities to exploit SBIRS sensor data for technical intelligence \$2,033 Total	g Group (ANIPG) sensor data for technical intellig	gence		
999	EY 2000 (\$ in Thousands) \$0 AFNPC FY 2000 funding is being executed in PE 0305917F	5917F			
3333	EY 2001 (\$ in Thousands) \$1,820 Technical support to the AF/NRO Integration Planning Group (ANIPG) \$1,550 Developing processing capabilities to exploit SBIRS sensor data for technical intelligence \$3,370 Total	g Group (ANIPG) sensor data for technical intellig	gence		
3	<b>B. Budget Activity Justification</b> (U) This PE is in Budget Activity 4 ('Demonstration and Validation') because the projects involve testing and demonstrating new cooperative efforts.	se the projects involve testing a	nd demonstrating new	cooperative efforts.	
<u>e</u>	C. Program Change Summary (\$ in Thousands)	EV 1000	FV 2000	FV 2001	Total Cost
99	Previous President's Budget (FY 2000 PBR) Appropriated Value	2,107 2,107 2,166	2,905	3,371	TBD
<u> </u>	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram	-59			
	e. Rescissions	ራ			
ш.	Project 644782	Page 2 of 6 Pages		Exhibit R-2 (PE 0603856F)	: 0603856F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	I SHEET (F	۲-2 Exhi	bit)		DATE <b>Februa</b>	February 2000
8UD <b>04</b>	вирсет Астіліт 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603856F Air FC (AFNPC)	ND TITLE Air Forc	e/National	Progran	PE NUMBER AND TITLE 0603856F Air Force/National Program Cooperation (AFNPC)	PROJECT 644782
<u>(2)</u>	C. Program Change Summary (\$ in Thousands) Continued		FY 1999	FY 2000		FY 2001	Total Cost
	f. Other					•	TBD
33	Adjustments to Budget Years Since FY 2000 FBK Current Budget Submit/FY 2001 PBR		2,033	Ü	0	-1 3,370	TBD
9	Significant Program Changes: (U) FY 1999: Discoverer II program funding is reflected in Program Element 0603401F, 'Advanced Spacecraft Technology', for consistency.	ent 0603401F, 'A	dvanced Spa	cecraft Techno	ology', for co	nsistency.	
	(U) FY 2000: Per Congressional direction, the AF/NRO Partnership, PE 0603856F, was merged with the National Security Space Architect (NSSA), PE 0305917F, into a new entity entitled 'AF/National Program Cooperation (AFNPC). AFNPC funding is being executed in the NSSA PE in FY 2000.	03856F, was mer C funding is bein	ged with the	National Secu	rrity Space A in FY 2000	rrchitect (NSSA), 1	PE 0305917F, into
	(U) FY 2001 forward: NSSA funding moves to a defense-wide PE (number TBD). AFNPC funding moves to this PE, 0603856F.	TBD). AFNPC	funding move	ss to this PE, C	)603856F.		
9	D. Other Program Funding Summary (\$ in Thousands)  EX 1999	FY 2002 Estimate	EY 2003 Estimate	EY 2004 Estimate	FY 2005 Estimate	Cost to	Total Cost
9	Intelligence Community* *Not available						
9	E. Acquisition Strategy (U) All major contracts awarded within this program will be awarded following full and open competition.	ving full and ope	1 competition	٠			
<u>e</u>	F. Schedule Profile			ļ		Î	
	1	2 3	4	ر ا ا	FX 2000 2 3	4 1 2	FY 2001 2 3 4
99	ANIPG Efforts:  1) Expeditionary Aerospace Force (EAF) Support Issues  *	*	*	*	×	×	×
<u>99</u>	-Rapid Targeting Support Workshop -Combat Identification Workshop	*					
93	-EAF-NRO Operations	*					
2 "		Page 3 of 6 Pages				Exhibit R-2	Exhibit R.2 (PE OG03856E)
		200 10 10 10 10 10 10 10 10 10 10 10 10 1				7.1101107	

	RDT&E BUDGET ITEM JUSTIFICATION SHEET		(R-2 Exhibit)	bit)			DATE		February 2000	2000	
80DC <b>04</b> -	вирсет Астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603856F Air Fo (AFNPC)	וס דוור⊑ Air Force/National Program Cooperation	e/Nati	onal	Progr	am Cc	opera	ıtion	РКОЈЕСТ <b>644782</b>	ЕСТ <b>782</b>
<b>(</b> 2)	E. Schedule Profile Continued	FY 1999			FY 2000	000			FY 2001	100	
1	1	2 3	4 +	<b></b> +	2	رس ;	4 ;	-;	7 ;	(ش)	4 ;
<u> </u>	2) Multi-Mission Satellites Exploration -Interagency Projects Office Workshon	* *	*	*	×	×	×	×	×	×	×
3	-Concept Evaluation MOA			*							
3	-Multi-mission CONOPS Development		*								
<u> </u>	3) Low-Density High-Demand (LDHD) Asset Relief Issues	*	*	*	×	×	×	×	×	×	×
9	- Collection Mgmt & Tasking Workshop . Intelligence Processing & Evnloitation Workshop		*		<b>&gt;</b>						
3	- Dissemination Workshop				<	×					
3	4) Space Staff Meeting Integration Reviews	*	*	*	×	×	×	×	×	×	×
<u> </u>	SBIRS TI Capability Development:										
9	GCS Mission Control Station Initial Operating Capability					×					
<u>e</u> :	NSTS/DICES Mission Control Station Initial Operating Capability					×					
<u> </u>	Remote Technical Intelligence Console Design & Development				<b>×</b> ;	×	×	×	×	×	×
<u> </u>	CIIC/BIIC Design & Development				×	×	×	×	×	×	×
9	Technical Intelligence Real Time Ops Design & Development				×	×	×	×	×	×	×
	* = Completed Event X = Planned Event										
	(U) Some ANIPG schedule events have changed from the FY00 President's Budget RDT&E Budget Item Justification Sheet for this PE as a result of reprioritization of efforts by the two ANIPG partner agencies.	udget RDT&E Bu	ıdget Item	Justifica	ttion Sh	eet for t	his PE a	ıs a resul	t of repri	oritizati	on of
	(U) SBIRS TI acronyms are as follows: GCS - Global Connectivity Service NSTS/DICES - NSA Secure Telephone System/Digital Integrated Communications Electronic System CTIC/BTIC - Collaborative Technical Intelligence Center	rations Electronic Intelligence Cent	System								
ď	Project 644782	Page 4 of 6 Pages						Exhibit	Exhibit R-2 (PE 0603856F)	06038	56F)

	RDT&E PROGRAM ELEMENT	SRAM ELE		/PROJECT	COST BF	COST BREAKDOWN (R-3)	WN (R-3)		DATE Fe	February 2000	000
800 <b>04</b>	вирсет аститу 04 - Demonstration and Validation	Validation			PE NUMBER AT 0603856F (AFNPC)		ce/Nation	ыр тп∟е Air Force/National Program Cooperation	n Cooper		РRОЈЕСТ <b>644782</b>
(G)	A. Project Cost Breakdown (\$ in Thousands)	ı (\$ in Thousanc	( <u>SI</u>				0001 723	o	EW 2000	ç	100C XII
999	Technical support to the AF/NRO Integration Planning Gro Develop processing capability to exploit SBIRS data for TI Total	NRO Integratior ty to exploit SBI	ı Planning Gre RS data for T	Group or TI			25.0	825 825 1,208 2,033		3000	1,820 1,550 3,370
	*FY 2000 funding for ANIPG and SBIRS-TI is being executed under PE 0305917F.	G and SBIRS-TI	is being exec	uted under PE (	305917F.						
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ory and Plannin	g Informatio	n (\$ in Thousa	(spu						
3	Performing Organizations: Contractor or Government	Contract Method/Type	Award or	Performing	Project						
	Performing Activity	or Funding Vehicle	Obligation Date	Activity EAC	Office EAC	Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
	Product Development Organizations (U) SMC	izations MIPR	12/98	TBD	TBD	0	1,208	0	1,550	11,089	13,847
	Support and Management Organizations (U) ANIPG Test and Evaluation Organizations Not Applicable	ganizations MIPR ations	10/98	Continuing	Continuing	0	825	0	1,820	Continuing	TBD
	*FY 2000 funding for ANIPG and SBIRS-TI is being executed under PE 0305917F.	G and SBIRS-TI	is being exec	uted under PE 0	305917F.						
<u> </u>	Government Furnished Property:  Control Methodology	operty: Contract Method/Type	Award or	Deliven		Total Deige	Didast	Dideet	Dridge	Dydret to	t e
	Description Product Development Property None	Vehicle	Date	Date		to FY 1999	FY 1999	EY 2000	EY 2001	Complete	Program
<u></u>	Project 644782			Ā	Page 5 of 6 Pages	jes			Exhibi	Exhibit R-3 (PE 0603856F)	303856F)

	RDT&E PROGRAM ELEMENT/PROJECT COST BREAKDOWN (R-3)	ST BREAKDOV	VN (R-3)		DATE Fe	February 2000	000
8UE <b>94</b>	BUDGET ACTIVITY  04 - Demonstration and Validation  (	PE NUMBER AND TITLE  0603856F Air Force/National Program Cooperation (AFNPC)	ce/Nation	al Progran	n Cooper	ation	РРОЈЕСТ <b>644782</b>
9	Government Furnished Property Support and Management Property None Test and Evaluation Property None Subtotals Subtotals Subtotal Support and Management Subtotal Test and Evaluation Total Project *FY 2000 funding for ANIPG and SBIRS-TI is being executed under PE 03059	Total Prior to FY 1999 0 0 0 0 0 17F.	Budget FY 1999 1,208 825 2,033	Budget FY 2000 0 0 0	Budget FY 2001 1,550 1,820 3,370	Budget to Complete 11,089 TBD TBD	Total Program 13,847 TBD TBD
	Project 644782	Page 6 of 6 Pages			Exhibi	Exhibit R-3 (PE 0603856F)	603856F)

RDT&E BUDGET ITEM JU	USTIFIC	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER 0603859	PE NUMBER AND TITLE 0603859F Pollut	PE NUMBER AND TITLE 0603859F Pollution	ention			PROJECT <b>644852</b>
COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644852 Pollution Prevention	0	0	2,543	2,672	2,732	2,787	2,842	Continuing	O8T
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
All funds were transferred from PE 65854f, Budget Activity 6 (Management & Support) to PE 63859f, Budget Activity 4 (Demonstration and Validation) beginning in FY to reflect the primary purpose of the funding profile; i.e. RDT&E Dem/Val of Pollution Prevention Technologies. See R-doc for PE 65854f for FY99 and FY00 program summaries.	y 6 (Manage )T&E Dem/	ment & Sup Val of Pollu	oport) to PE ( tion Preventi	53859f, Budion Technok	get Activity gies. See I	4 (Demonsti R-doc for Pl	ration and V E 65854f for	alidation) be r FY99 and I	6 (Management & Support) to PE 63859f, Budget Activity 4 (Demonstration and Validation) beginning in FY01 [ RE Dem/Val of Pollution Prevention Technologies. See R-doc for PE 65854f for FY99 and FY00 program
(U) A. Mission Description FY01 funds will be used to target R&D activities that of burden associated with National Emissions Standards for the contract of th	t demonstrat s for Hazardo	e and valida ous Air Poll	ite alternative utants (Clear	aircraft pai Air Act dri	nting/depain ven), and otl	ıting, mainte her hazardov	nance proce 1s waste red	sses that reduction Dem/	demonstrate and validate alternative aircraft painting/depainting, maintenance processes that reduce compliance for Hazardous Air Pollutants (Clean Air Act driven), and other hazardous waste reduction Dem/Val requirements.

get pollution prevention technologies, including replacement of chromate conversion coating on aluminum and magnesium based metals, nonchromated primers to replace zinc chromate, and environmentally safe replacement for cadmium plating.

### EY 1999 (\$ in Thousands) 56

\$0 Total	FY 2000 (\$ in Thousands) \$0 No Activity \$0 Total
<u>39</u>	555

### EX 2001 (\$ in Thousands) 99

` _		
9	\$518	Resource Conservation and Recovery Act (RCRA) Subtitle C - Hazardous Waste
9	\$100	Resource Conservation and Recovery Act (RCRA) Subtitle D - Solid Waste
9	668\$	Clean Air Act
9	\$235	Clean Water Act
9	\$549	Hazardous Material Reduction

Total \$549 \$242 \$2,543 

Other

Exhibit R-2 (PE 0603859F)	
Page 1 of 5 Pages	
Project 644852	

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	TION SHEET (R-	2 Exhit	) Sit		DATE February 2000	2000
₩ 7	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>	PE NUMBER AND TITLE 0603859F Pollution	TITLE Pollution	Prevention	์ เ		PROJECT <b>644852</b>
<u> </u>	B. Budget Activity Justification This program is in Budget Authority (BA) 4, Demonstration and Validation, because this account is primarily for Research, Demonstration, Testing and Evaluation demonstration and validation of pollution prevention technologies to eliminate/reduce hazardous materials/waste and overall total ownership costs to the Air Force. 6, Management and Support, was the prior BA that will terminate the end of FY00.	idation, because this accou eliminate/reduce hazardou end of FY00.	ınt is primaı ıs materials.	ily for Resea 'waste and ov	rch, Demons erall total ov	tration, Testing and E	valuation Air Force. BA
9	C. Program Change Summary (S in Thousands)	Ţ	FV 1999	FV 2000		FY 2001	Total Cost
99	Previous President's Budget (FY 2000 PBR) Appropriated Value	1				2,566	TBD
<u> </u>							
·	d. Below Threshold Reprogram e. Rescissions						
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR 'Other' represents non-pay inflation adjustments to current budget year.	ar.				-23 2,543	TBD
Ð	Significant Program Changes: None.						
9	D. Other Program Funding Summary (\$ in Thousands)  FY 1999 FY 2000 FY 2001 Actual Estimate Estimate	<u>FY 2002</u> ] Estimate	FY 2003 Estimate	FY 2004 Fstimate	FY 2005 Estimate	Complete	<u>Total Cost</u>
99	AF RDT&E Other APPN Not Applicable						
<u>e</u>	E. Acquisition Strategy Not Applicable						
	Project 644852	Page 2 of 5 Pages				Exhibit R-2 (PE 0603859F)	. 0603859F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)		DATE February 2000
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0603859F Pollution Prevention	PROJECT <b>644852</b>
(U) E. Schedule Profile	3 2	EY 2001 4 1 2 3 4
<ul><li>(U) Prototype Development</li><li>(U) Demonstration/Validation</li><li>(U) Contract Completion</li></ul>		×
Project 644852	Page 3 of 5 Pages	Exhibit R-2 (PE 0603859F)

	RDT&E PROGRAM ELEMENT	RAM ELE		/PROJECT COST BREAKDOWN (R-3)	OST BI	₹EAKDO\	WN (R-3)		DATE <b>Fe</b>	February 2000	00
80D <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	alidation			PE NUMBER AN <b>0603859F</b>		ID TITLE Pollution Prevention	ıtion		9	PROJECT <b>644852</b>
<u>3</u>	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousan	(इक्				FV 1000	000	FV 2000	ç	EV 2001
999999	Development Test and Evaluation Operational Test and Evaluation Contractor Engineering Support Program Management Support Miscellaneous Total	ution ion ort rt					]			21	423 749 1,100 200 71 2,543
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	ry and Plannir	g Informatic	ın (\$ in Thousanc	(হা						
ව	Performing Organizations: Contractor or Government Performing	Contract Method/Type or Funding	Award or Obligation	Performing Activity	Project Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity Vehicle Product Development Organizations	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	Air Force Research Lab	TBD	UNK	N/A	A N	0 0	00	00	711		711
	Support and Management Organizations Aerospace Systems Center TBD	anizations TBD	C NK	N/A	N/A	0	0	0	757		757
	Test and Evaluation Organizations NDCEE TBI	tions TBD	UNK	N/A	N/A	0	0	0	260		260
<u> </u>	Government Furnished Property:  Continueth  Item  Description  Product Development Property  None	perty: Contract Method/Type or Funding Vehicle	Award or Obligation Date	<u>Delivery</u> Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	Project 644852		:	Pag	Page 4 of 5 Pages	çes			Exhibi	Exhibit R-3 (PE 0603859F)	03859F)

RDT&E PROGRAM ELEMENT/PROJECT	/PROJECT COST BREAKDOWN (R-3)	'N (R-3)	DATE F	February 2000	00
вирдет астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603859F Pollution Prevention	n Prevention		PF 64	РRОЈЕСТ <b>644852</b>
Support and Management Property None Test and Evaluation Property None Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	Total Prior to FY 1999 0 0 0 0	Budget Budget FY 1999 FY 2000 0 0 0 0 0 0 0 0	get Budget 0 FY 2001 0 1,526 0 260 0 2,543	Budget to Complete	Total Program 1,526 757 260 2,543
Project 644852	Page 5 of 5 Pages		Exh	Exhibit R-3 (PE 0603859F)	3859F)

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	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	hibit)		DATE	Februa	February 2000
8UDGI <b>04 -</b>	вирбет Астипту 04 - Demonstration and Validation			PE NUMBER AND TITLE 0603860F Joint Systems - Dem/	PE NUMBER AND TITLE O603860F Joint Pro Systems - Dem/Val	PE NUMBER AND TITLE  0603860F Joint Precision Approach and Landing Systems - Dem/Val	Αρρrοε	ıch and I	anding-	РВОЈЕСТ <b>644652</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644652	Precision Landing Systems	19,602	16,290	18,092	9,717	13,190	10,162	9,464	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<b>5</b> 55555	A. Mission Description  The objective of the Joint Precision Approach and Landing System (JPALS) is to provide the next generation precision approach and landing system contribute to a joint operational reapability for the U.S. forces in order to perform assigned conventional and special operational missions from fixed bases, tactical, shipboard and special mission environments under a wide range of meteorological conditions. Additionally, JPALS will ensure that DOD maintains civil interoperability with current and projected FAA and NATO member country landing systems. This effort will modernize the DoD precision landing architecture by replacing aging ship-board and ground precision landing systems. This effort will modernize the DoD precision landing systems and Instrument Carrier Landing System, which can expected to end their useful life by 2002-2010 Landing System; which can have the ability to operate to end their useful life by 2002-2010 Landing shilling by Chocs to land on any surface worldwide (land and sea) under peacetime and hostile conditions. Assured landing ability will improve theater closure times for deploying forces, intra-theater logistics throughput, and our ability to fight at night and in bad weather. Furthermore, JPALS will provide precision landing eapabilities where they do not currently exist, in special mission areas and aboard naval uses est that are equipped for aircraft but do not have roll-out landing surfaces. It will also enhance unirreoperability for Naval aircraft landing at shore-based fields operated by other services, and it will ensure interoperability for Naval aircraft landing at shore-based fields operated by other services, and it will ensure interoperability for Naval aircraft and will almost eretainly include a ground segment.  FY 1999 (5 in Thousands)  Sy,768  Began aircraft risk reduction studies and integration analyses  Began aircraft risk reduction studies and integration analyses  Began shipboard risk reduction studies and integration analyses  Total	nding Syste forces in or vide range o JATO meml ing systems heir useful I weather cone eacetime an ght at night a val vessels t ed fields op i. This effor h the Air Fo rements Def tudies and in n studies and in Area Differe	ding System (JPALS) is to providences in order to perform assign ide range of meteorological cond ATO member country landing sylg systems (Instrument Landing Seir useful life by 2005-2010 and eather conditions by day or night actime and hostile conditions. And at night and in bad weather. Fal vessels that are equipped for a fields operated by other servic. This effort may result in modificate Air Force designated as lead rements Definition (ARD) activitial dies and integration analyses studies and integration analyses rea Differential Global Positionii	ding System (JPALS) is to provide the next generation precision approach and landing system capability that will forces in order to perform assigned conventional and special operational missions from fixed base, tactical, ide range of meteorological conditions. Additionally, JPALS will ensure that DoD maintains civil ATO member country landing systems. This effort will modernize the DoD precision landing architecture by us systems (Instrument Landing System, Precision Approach Radar, Microwave landing System, and Instrument eir useful life by 2005-2010 and address precision landing deficiencies in the near term. JPALS will be rapidly eather conditions by day or night. JPALS will facilitate DoD mission and training needs by enabling US forces to acetime and hostile conditions. Assured landing ability will improve theater closure times for deploying forces, that a night and in bad weather. Furthermore, JPALS will provide precision landing capabilities where they do not all vessels that are equipped for aircraft but do not have roll-out landing surfaces. It will also enhance affelds operated by other services, and it will ensure interoperability for the Civil Reserve Air Fleet at DoD. This effort may result in modification to avionics in over 15,000 DoD aircraft and will almost certainly include a utle Air Force designated as lead service.  Ements Definition (ARD) activities and integration analyses studies and integration analyses	the next ger conventions ons. Additions. Additions. This e stem, Precis dress precisi PPALS will ured landing hermore, JP and it will e tion to avior rrvice.	neration precal and special and special and special annually, JPAI ffort will me ion landing a facilitate Dog ability will prot have rollarsure interonics in over Jesus protot (GPS) protot	sision appro al operations. S will ensu odernize the the Radar, M deficiencies. D mission a improve the ovide precis out landing perability for 15,000 DoD	ach and lanc Il missions f re that DoD DoD precis icrowave la in the near i und training eater closure sion landing surfaces. I or the Civil I aircraft and	ling system of from fixed ba maintains ci ion landing system ading System of the cerm. JPALS needs by ena capabilities of will also en Reserve Air will almost	
Ŗ	Project 644652	:	Page	Page 1 of 5 Pages	70				Exhibit R-2	Exhibit R-2 (PE 0603860F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R-2	Exhibit)		DATE February 2000	2000
90E	вирсет Астіvітץ 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603860F Joint Pro Systems - Dem/Val	π∟ε vint Precis vm/Val	ion Approacł	PE NUMBER AND TITLE 0603860F Joint Precision Approach and Landing Systems - Dem/Val	РRОЈЕСТ <b>644652</b>
(D)	A. Mission Description Continued					
555	FY 2000 (\$ in Thousands) \$721 Continue Architecture Definitions \$078	o ono lycae				
99999	Continue anctair tast reduction Continue shipboard risk reducti Continue development of Local Begin Aircraft Avionic Develop Total	n analyses tion analyses bal Positioning Syst	em prototype:	<i>1</i> 0		
) [	(St. 2001 (\$ -1 The control of the c					
<b>333</b>	EY 2001 (\$ in Thousands) \$333 Complete Architecture Definitions \$008	2002				
999	4 %	rtion analyses bal Positioning Sys	tem prototyne	<b>v</b>		
333	Continue Aircraft Avionic Deve			,		
9	<b>B. Budget Activity Justification</b> This program is in budget activity 4 - Demonstration and Validation, Research must be identified and integrated into the precision landing architecture.	h Category 6.4B be	cause support	ability and manufa	nd Validation, Research Category 6.4B because supportability and manufacturing process design considerations ling architecture.	onsiderations
9	C. Program Change Summary (\$\sigma\$ in Thousands)	EV	EV 1000	EV 2000	EV 2001	Totol 7
555	Previous President's Budget (FY 2000 PBR) Appropriated Value Adjustments to Appropriated Value	7 5 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7 5 7	21,456 22,057	16,488 16,488	18,253	TBD
<u> </u>	a. Congressional/General Reductions b. Small Business Innovative Research		-601 -703	-198		
	c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions	-1	-1,041 -110			
	Project 644652	Page 2 of 5 Pages			Exhibit R-2 (PE 0603860F)	: 0603860F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (I	۲-2 Exhi	bit)	DATE	те February 2000	, 2000
800 <b>94</b>	вирсет астилту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0603860F Joint Pro Systems - Dem/Val	ND TITLE Joint Pre Dem/Val	ecision Ap	PE NUMBER AND TITLE 0603860F Joint Precision Approach and Landing Systems - Dem/Val	d Landing	РКОЈЕСТ <b>644652</b>
(D)	C. Program Change Summary (\$ in Thousands) Continued		FY 1999	FY 2000		FY 2001	Total Cost
ş !	f. Other						TBD
<u> </u>	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR		19,602	16,290		-161 18,092	TBD
(5)	Significant Program Changes: FY 2001 reflects congressional and general reductions of 7.1% (\$1,171) to the overall program and an additional 10% general reduction (\$824) to the portion of this effort funded by the Air Force	ne overall progr	am and an ad	ditional 10% g	eneral reductic	n (\$824) to the pc	rtion of this
9	D. Other Program Funding Summary (\$\sin \text{Thousands}\) \[\frac{\text{FY 1999}}{\text{FY 2000}}\] \[\frac{\text{FY 2001}}{\text{Actual}}\] \[\frac{\text{Actual}}{\text{Retimate}}\]	FY 2002 Estimate	FY 2003 Ferimate	FY 2004	FY 2005 Estimate	Cost to	Total Cost
9	Not applicable	Applinaci	Totillian	4,088	4,149	analdina.	TBD
9	E. Acquisition Strategy Demonstration and Validation, multiple contracts, Fixed Price Incentive Fee (FPIF), Firm Fixed Priced contracts (FFP); no Non-Developmental Items (NDI)	(FPIF), Firm Fis	ted Priced cor	ntracts (FFP); 1	no Non-Develc	opmental Items (N	DI)
9	F. Schedule Profile	FY 1999		FY 2000	000	FY	FY 2001
	I	2 3	4	1 2	3 4	1 2	3 4
99	Acquisition Milestones: Milestone 0 (3d Otr. FY96)						
3	Architecture and Requirements Definition Phase						
9	Definition studies *			×		×	
9	Integration Analyses *			×		×	
9	Prototype/Avionic Development Contracts						
9	LDGPS Conract Award	*					
9	SRGPS Contract Award	* *					
9	Data Lilik Collidati Awaru Milestone 0 was finded under PE35114F						
	* Architecture and requirements Definition Phase authorized by USD(A&T) by memorandum on 18 Sep 1998	by memorandur	n on 18 Sep 1	866			_
_	Project 644652	Page 3 of 5 Pages				Exhibit R-2 (PE 0603860F)	E 0603860F)
		1					

	RDT&E PROGRAM ELEMENT	AM ELE		I/PROJECT CO	COST BF	BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	00
BUE <b>04</b>	вирсет аститу 04 - Demonstration and Validation	lidation			PE NUMBE 060386 System	PE NUMBER AND TITLE 0603860F Joint Precision Approach and Landing Systems - Dem/Val	recision / al	Approach	and Lanc		РRОЈЕСТ <b>644652</b>
(D)	A. Project Cost Breakdown (\$ in Thousands)	in Thousand	(3				0001 X4	o	200.737	ç	1000 730
(L)	Prototyme Develonment						T o	9 885	6 878	⊇l∝	6 986
3		Š					, <sub>0</sub>	6,949	8,176	9	9,952
3		Support					1,	1,972	663	3	602
99	RTO Activities Program Management Support							240 478	341 205	- 5	281 228
333							19,	78 19,602	27 16,290	0	43 18,092
3	B. Budget Acquisition History and Planning Information (\$ in Thousands)	and Planning	Information	(\$ in Thousands	ଜ						
3	Performing Organizations:										
	Contractor or										
	<b>+</b> 1	a	Award or	<u>Performing</u>	Project						-
	ing	. Ba	Obligation	Activity	Office	Total Prior	Budget	Budget	Budget	Budget to	Total
	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	FY 2000	FY 2001	Complete	Program
	12	tions									
		CPAF	May 99	TBD	TBD	0	4,582	4,665	4,876	Continuing	TBD
	stems (SRGPS)	CPFF	June 99	TBD	TBD	0	2,852	2,900	3,985	Continuing	TBD
		FFP	Jan 99	TBD	TBD	0	1,060	206	855	Continuing	TBD
	Inc		Feb 99	TBD	TBD	0	1,811	1,161	1,324	Continuing	TBD
	Inc.		Apr 99	TBD	TBD	0 (	953	728	1,091	O .	2,772
	Navy PMA21381 R	Keimbursable	Nov 99	TBD	UBI Car	<b>-</b>	3,409	3,133	2,784	Continuing	TBD
		Crar FFP	Jan 99	15D 451	155 451		451	000	0	Continuing	1BD 451
	o	FPFF	May 99	TBD	TBD	0	415	376	150	0	941
		IDIQ	Apr 99	TBD	TBD	0	340	112	141	Continuing	TBD
	evada Corp	CPFF	Mar 99	TBD	TBD	0	243	129	181	Continuing	TBD
	Various	Various	Various	TBD	TBD	0	1,105	287	837	Continuing	TBD
	Project 644652			Расе	Page 4 of 5 Pages	y.			Exhib	Exhibit R-3 (PF 0603860E)	SO3860F)
	Floject UTTOUE			, co. 1	7 1017 145	S			באוואן	0 1 1/ 0 - 1 1	100000

	RDT&E PROGRAM ELEMENT	MENT/P	//PROJECT COST BREAKDOWN (R-3)	OST BF	<b>EAKDOV</b>	VN (R-3)		DATE F	February 2000	000
8UD( <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBE 060386 System	PENUMBER AND TITLE 0603860F Joint Precision Approach and Landing Systems - Dem/Val	recision /	Approach	and Lan	ding	PROJECT <b>644652</b>
(c)	Performing Organizations Continued: Support and Management Organizations MITRE Corp FFP Various	Various Various	TBD	TBD	0	310	218	226	Continuing Continuing	TBD
	Test and Evaluation Organizations Navy - NAWCAD No Contracts more than \$1.0M	Nov 99	TBD	TBD	0	240	341	281	Continuing	TBD
9	Government Furnished Property:  Contract  Method/Type Item Or Funding Description Vehicle Product Development Property N/A Support and Management Property N/A	Award or Obligation Date	Delivery Date		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
	Test and Evaluation Property N/A Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project				Total Prior to FY 1999 0 0 0 0	Budget FY 1999 18,494 868 240 19,602	Budget FY 2000 15,380 569 341 16,290	Budget FY 2001 17,223 588 281 18,092	Budget to Complete TBD TBD TBD TBD	Total Program TBD TBD TBD
<u>a</u>	Project 644652		Pag	Page 5 of 5 Pages	85			Exhib	Exhibit R-3 (PE 0603860F)	503860F)

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	RDT&E BUDGET ITEM JU	_	ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	chibit)		DATE	ŧ	February 2000
BUDG <b>04 -</b>	вирсет астилтү 04 - Demonstration and Validation			PE NUMBER 0604237 Aircraft	PE NUMBER AND TITLE 0604237F Varial Aircraft	ble Stabi∣	lity In-Fli	ght Simu	PE NUMBER AND TITLE 0604237F Variable Stability In-Flight Simulation Test Aircraft	PROJECT
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
643308	<ul><li>Variable Stability In-Flight Simulation Test Aircraft</li></ul>	3,833	0	0	0	0	0	0	0	59,508
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
£	A. Mission Description  This program uses a modified F-16D to create a versatile high-performance flying simulator to replace the NT-33A aircraft, which retired in May 1997. For the past 39 years, the research and development flight test community extensively employed the variable stability NT-33A for flight evaluation of fielded aircraft upgrades and new aircraft developments. Its success has been directly attributable to its relatively low-cost of operation, rapid response to customer needs, and high degree of credibility in the flight test community. VISTA was developed to replace the NT-33A because the NT-33A's performance was not representative of future aircraft (it was the oldest aircraft in the Air Force still actively flying). VISTA has the capability to simulate a wide range of air vehicles to verify crucial flight control and human factor designs, establish flying qualities specification criteria, and operate as a flying laboratory for flight control and cockpit display research. In addition, the Air Force Test Pilot School has used VISTA, as they have the NT-33A, to safely train test pilots to evaluate aircraft handling quality, avionics, and human factors designs in a realistic high-performance environment. Note: Congress added \$6.0 million to this PE in FY 1998 and \$4.0 million in FY 1999 for VISTA. There are no plans to request future funding in this PE to continue operating the VISTA aircraft. In FY 2000, the Air Force will either retire the VISTA or transfer the airplane to another Air Force organization, the National Aeronautics and Space Administration, or industry.	satile high-p nunity extens attributable t to replace th \tau has the cap perate as a fi o safely train ded \$6.0 mill aircraft. In F	erformance sively emplc to its relative to its relative to ST-33A by ability to sin ying laborat ying laborat liest pilots to this F ion to this F vor industry, or industry	flying simula yed the variable low-cost occuse the Naulate a widdory for flight occusion for evaluate ain PY 199 occusion and PE in FY 199	ator to replace able stability of operation VT-33A's per e range of ai t control and treraft handling and \$4.0 mill either retribulants.	te the NT-33 for an area for the NT-33 for the trapid respond to the trapid respond to the trapid respond to the trapid for th	A aircraft, v r flight evalh nse to custon as not reprecionally research verify crucionally research vionics, and vionics, and vionics, and A or transfe.	which retired untion of fiel mer needs, a sentative of al flight con 1. In additio I human fact ISTA. Ther r the airplan	in May 199 Ided aircraft and high degr future aircraft frol and hum in, the Air Fo iors designs i e are no plan e to another.	tile high-performance flying simulator to replace the NT-33A aircraft, which retired in May 1997. For the past 39 mity extensively employed the variable stability NT-33A for flight evaluation of fielded aircraft upgrades and new tributable to its relatively low-cost of operation, rapid response to customer needs, and high degree of credibility or replace the NT-33A because the NT-33A's performance was not representative of future aircraft (it was the oldest has the capability to simulate a wide range of air vehicles to verify crucial flight control and human factor designs, arate as a flying laboratory for flight control and cockpit display research. In addition, the Air Force Test Pilot safely train test pilots to evaluate aircraft handling quality, avionics, and human factors designs in a realistic of \$6.0 million to this PE in FY 1998 and \$4.0 million in FY 1999 for VISTA. There are no plans to request future recraft. In FY 2000, the Air Force will either retire the VISTA or transfer the airplane to another Air Force ninistration, or industry.
විව් වි	\$3,833 Continued upgrade program that provides electrical and mechanical interfaces for future installation of an F100-PW-299 engine with an existing axisymmetric thrust vectoring nozzle and a programmable display subsystem, and continued flight testing to investigate flight control laws and performance characteristics of fielded aircraft upgrades, new aircraft developments, and test pilot training.  \$3,833 Total	hat provides ; nozzle and ; f fielded airci	electrical ar. a programm raft upgrade	nd mechanica able display s, new aircra	al interfaces subsystem, a	for future insand continue	stallation of d flight testi t pilot traini	an F100-PW ing to investi ng.	V-299 engine igate flight o	with an existing ontrol laws and
999	FY 2000 (\$ in Thousands) \$0 No Activity. \$0 Total									-
ď	Project 643308		Page	Page 1 of 4 Pages	<b>ဂ</b>				xhibit R-2 (	Exhibit R-2 (PE 0604237F)

	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)	t)	DATE February 2000	2000
8UDC <b>04</b> -	BUDGET ACTIVITY 04 - Demonstration and Validation	PE NUMBER AND TITLE 0604237F Variable Stability In-Flight Simulation Test Aircraft	tability In-Fli	ght Simulation Test	PROJECT <b>643308</b>
9	A. Mission Description Continued				
565	FY 2001 (\$ in Thousands) \$0 No Activity. \$0 Total				
9	<b>B. Budget Activity Justification</b> This program is in Budget Activity 4, Demonstration and Validation, since it includes efforts necessary to evaluate integrated technologies in as realistic an operating environment as possible to assess performance or cost reduction potential.	includes efforts necessary to ev	aluate integrated	technologies in as realistic a	n operating
9	C. Program Change Summary (\$ in Thousands)	FY 1999	FY 2000	FY 2001	Total Cost
99	Previous President's Budget (FY 2000 PBR) Appropriated Value	3,989	0 0	0	
<u>5</u>	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research	-11 -135			
	c. Omnibus or Other Above Threshold Reprogram d. Below Threshold Reprogram e. Rescissions	-21	c		
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR	3,833	· 0	0	
<u>6</u>	<u>Significant Program Changes:</u> Not Applicable.				
Ф	Project 643308 Page	Page 2 of 4 Pages		Exhibit R-2 (PE 0604237F)	0604237F)

	RDT&E BUDGET ITEM JU		) JEEK	SATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ext	ibit)		DATE	February 2000	ry 200(	
BUDGE <b>04 - C</b>	BUDGET ACTIVITY <b>04 - Demonstration and Validation</b>				PE NUMBER AND TITLE 0604237F Varial Aircraft	AND TITLE F Variabl	PE NUMBER AND TITLE 0604237F Variable Stability In-Flight Simulation Test Aircraft	In-Fligh	nt Sim⊨	ulation Te		РКОЈЕСТ <b>643308</b>
ā (a)	D. Other Program Funding Summary (\$ in Thousands)  FY 1999  Actual Estimate	in Thousands) FY 2000 Setimate		FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	0.5 ate	Cost to Complete	[ · ]	Total Cost
(C)	Related Activities: PE 0602201F, Aerospace Flight Dynamics. PE 0603245F, Flight Vehicle Technology Integration.								I			
(C)	<b>E. Acquisition Strategy</b> Not Applicable.											
(U) E	F. Schedule Profile			•	X 199		됩,	EY 2000	•	а,	EY 2001	7
<u>a</u>	(U) Not Applicable.			-	7	4	7	n	4	7	n	4
Pro	Project 643308			Pag	Page 3 of 4 Pages					Exhibit R-2 (PE 0604237F)	PE 060	4237F)

	RDT&E PROGRAM ELEMENT/PF	/PROJECT COST BREAKDOWN (R-3)	BREAKDO	WN (R-3)		DATE Fe	February 2000	8
8UE <b>04</b>	BUDGET ACTIVITY  04 - Demonstration and Validation	PE N 060 Air	PE NUMBER AND TITLE 0604237F Variable Stability In-Flight Simulation Test Aircraft	ble Stability	y In-Flight	Simulatio		РРОЈЕСТ <b>643308</b>
(£)	A. Project Cost Breakdown (\$ in Thousands)			FV 1000	000	000C 75	ç	EV 2001
55	Not Applicable. Total				222	7 7	21	177
9	B. Budget Acquisition History and Planning Information (\$ in Thousands)	(\$ in Thousands)						
9	Performing Organizations:  Contractor or  Government Method/Type Award or  Performing or Funding Obligation Activity Vehicle Date	Performing Pro Activity Of FAC	Project Office Total Prior FAC to FV 1999	Budget FV 1999	Budget FY 2000	Budget FY 2001	Budget to	Total Program
	Development Organizations and Management Organizations  Evaluation Organizations licable.					1002		
	Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project		Total Prior to FY 1999	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total Program
_								
	Project 643308	Page 4 of 4 Pages	4 Pages			Exhibi	Exhibit R-3 (PE 0604237F)	04237F)

	RDT&E BUDGET ITEM JU		ATION	STIFICATION SHEET (R-2 Exhibit)	(R-2 Ex	thibit)		DATE	February 2000	y 2000
BUDG <b>04</b> -	BUDGET ACTIVITY  04 - Demonstration and Validation			PE NUMBER AI <b>0604327F</b>		மார். Hardened Target Munitions	yet Munit	ions		PROJECT <b>644641</b>
	COST (\$ in Thousands)	FY 1999 Actual	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
644641	11 Hard and Deeply Buried Target Defeat System (HDBTDS)	2,466	4,840	0	0	0	0	0	0	11,455
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0
<b>(</b> 2)	A. Mission Description  The Hard and Deeply Buried Target Defeat System (HDBTDS) program is an effort designed to hold at risk those highest priority assets essential to the enemy's war fighting ability, which are heavily defended and protectively hardened. Hardening techniques include construction of facilities, many of which are deep underground with multiple layers of reinforced concrete, rock rubble, and/or earth overburden. Other hardened targets include operations within caves, tunnels, and mountains built using rapidly improving construction equipment exported by allies and adversaries on a large scale. (Examples include enemy command and control facilities, air defense facilities for the production, storage, and deployment of weapons including weapons of mass destruction, surface missile launch sites, aircraft storage sites, artillery sites.) Potential solutions include (but are not limited to) Special Forces, conventional short or long range ballistic missiles (land or sea launched), cruise missiles, direct attack munitions, and standoff weapons.	HDBTDS) program ectively hardened. Fole, and/or earth over orted by allies and ac, and deployment of ms include (but are rich standoff weapons.	rogram is ar ened. Hard rth overbur s and adverr rment of we out are not li eapons.	n effort desig ening technic den. Other h saries on a la apons includ imited to) Sp	med to hold ques include ardened targ rge scale. (I ing weapon: ecial Forces	at risk those construction gets include of Examples in s of mass det	highest pric n of facilitie operations v clude enemy struction, su	rrity assets e s, many of v rithin caves, r command a rface to surf ong range ba	DBTDS) program is an effort designed to hold at risk those highest priority assets essential to the enemy's writively hardened. Hardening techniques include construction of facilities, many of which are deep undergroue, and/or earth overburden. Other hardened targets include operations within caves, tunnels, and mountains ted by allies and adversaries on a large scale. (Examples include enemy command and control facilities, air and deployment of weapons including weapons of mass destruction, surface to surface missile launch sites, is include (but are not limited to) Special Forces, conventional short or long range ballistic missiles (land or standoff weapons.	IDBTDS) program is an effort designed to hold at risk those highest priority assets essential to the enemy's war tively hardened. Hardening techniques include construction of facilities, many of which are deep underground e, and/or earth overburden. Other hardened targets include operations within caves, tunnels, and mountains built red by allies and adversaries on a large scale. (Examples include enemy command and control facilities, air, and deployment of weapons including weapons of mass destruction, surface to surface missile launch sites, is include (but are not limited to) Special Forces, conventional short or long range ballistic missiles (land or sea I standoff weapons.
	An Analysis of Alternatives (AOA) was conducted to evaluate the weapon concepts to determine the most promising concepts to move forward into a follow-on program. The potential weapon concepts were evaluated in an air campaign analysis. The results of the AOA were presented to the Joint Requirements Oversight Council (JROC) in 4th Quarter FY 1999.	o evaluate the	e weapon co r campaign	ncepts to del analysis. Th	termine the	most promis the AOA we	ing concept: re presentec	s to move for I to the Joint	evaluate the weapon concepts to determine the most promising concepts to move forward into a follow-on sted in an air campaign analysis. The results of the AOA were presented to the Joint Requirements Oversig	follow-on ts Oversight
5555	The AOA is being documented into a report for future reference. The primary legacy hard target penetrator weapon, GBU-28, will be tested in rock to validate compu models used in the AOA analysis and to provide test data for future use when considering weapon design alternatives for increased penetration capability. The results will be presented in 1st Quarter FY 2001.  EY 1999 (\$\frac{\psi}{\psi}\$ in Thousands)  \$1,083  Completed Analysis of Alternatives (AOA) study effort.  \$1,383  Continue field agency activities to support planning efforts (acquisition support and documentation).  \$2,466  Total	e reference. data for futu atives (AOA es to support	The primar re use when re standard standard effort planning ef	y legacy har ı considering ırt. fforts (acquis	d target pene weapon des ition suppor	etrator weapo sign alternati frand docum	on, GBU-28 ves for incre	, will be test cased penetr	ed in rock to ation capabili	reference. The primary legacy hard target penetrator weapon, GBU-28, will be tested in rock to validate computer ata for future use when considering weapon design alternatives for increased penetration capability. The results tives (AOA) study effort.
Pr	Project 644641		Page	Page 1 of 6 Pages				ш	Exhibit R-2 (	Exhibit R-2 (PE 0604327F)

	RDT8	RDT&E BUDGET ITEM JUSTIFICATION	STIFICATION SHEET (R-2 Exhibit)		DATE February 2000	000
JB <b>2</b>	вирсет астилту 04 - Demonstration and Validation	and Validation	PE NUMBER AND TITLE 10604327F Hardened Target Munitions	arget Munitic		PROJECT <b>644641</b>
3	A. Mission Description Continued	ion Continued				
99	EX 2000 (\$ in Thousands) \$1.100	cument AOA analvsis into a	report for fithire reference and use hy other DoD analysis arominations. Immediate 1446 in 45, in 45, 4004	on Citorian State of	Transcendent John St. A A A A	F
•			set, key intelligence inputs and requesthodology.	uirements, weapor	n concept descriptions includ	eport will ling life
<u>(</u>	\$2,290	Conduct GBU-28 rock test program. This includes acquiring GBU-28 test assets and launching the weapons from F-15E aircraft into rock	rection of the sector of the s	unching the weap	oons from F-15E aircraft into	rock
9	\$970	cargots to variuate inouchs and provide data for potential future design of improved warhead penetration capability.  Conduct field agency activities. This includes project office and contractor support to manage the Hardened Targo	Davide data for potential future design of improved warhead penetration capability.  This includes project office and contractor support to manage the Hardened Target Munitions program,	nead penetration can manage the Harder	apability. ned Target Munitions prograi	į,
9	\$480	consisting of testing GBU-28 in rock in coordination v System Engineering and Technical Analysis (SETA)	rock in coordination with the Defense Threat Reduction Agency (DTRA), and documentation of the AOA.	Agency (DTRA)  GBU-28 performs	), and documentation of the A ance in rock and design analy	AOA. ysis and
9	\$4,840	prototype evaluation of potential future upgrades to th Total	future upgrades to the GBU-28 5000 lb hard target penetrator weapon and other legacy weapons.	netrator weapon an	nd other legacy weapons.	
333	FY 2001 (\$ in Thousands) \$0 No \$0 Tot	<u>inds)</u> No Activity Total				
9		B. Budget Activity Justification This program is in budget activity 4 - Demonstration and Validation, because the program would develop a Hard Target Munitions capability to precisely hit and destroy hard and deeply buried targets not currently held at risk.	e the program would develop a Ha	rd Target Munitio	ns capability to precisely hit.	and destroy
9		C. Program Change Summary (\$ in Thousands)				
555	Previous President's I Appropriated Value	Previous President's Budget (FY 2000 PBR) Appropriated Value	EY 1999 9,803 3,000	EY 2000 4,910 4,910	EX 2001 0	Total Cost 14,713 7,910
0	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research c. Omnibus or Other Above Threshold	Adjustments to Appropriated Value a. Congressional/General Reductions b. Small Business Innovative Research c. Omnibus or Other Above Threshold Reprogram	.451 -69	-70		
	d. Below Threshold Reprogram e. Rescissions	eprogram	-14			
	f. Other			0		
<u></u>	Project 644641	Page	Page 2 of 6 Pages		Exhibit R-2 (PE 0604327F)	04327F)

	RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	N SHEET (	R-2 Exhi	bit)	<u></u>	DATE February 2000	2000
80D <b>04</b>	вирсет астипту 04 - Demonstration and Validation	PE NUMBER AND TITLE 0604327F Harde	AND TITLE Hardene	PE NUMBER AND TITLE 0604327F Hardened Target Munitions	Aunitions		PROJECT <b>644641</b>
<u>(</u>	C. Program Change Summary (\$ in Thousands) Continued		EV 1000	EV 2000		FV 2001	Total Coat
99	Adjustments to Budget Years Since FY 2000 PBR Current Budget Submit/FY 2001 PBR		2,466	4,840		0	0 11,455
<u>(D</u>	Significant Program Changes: Funding: FY 1999 funding was reduced from \$9.8M to \$3.0M for the Air Force and from \$9.8M to \$3.0M for the Navy. This reduction eliminated ongoing paramete analysis and trade study efforts. All Air Force and Navy funding was combined to complete the AOA analysis and prepare for follow-on program. FY 2000 funding was added to document the AOA into a report; conduct testing and evaluation of the GBU-28 5000 lb weapon in rock; and perform design analysis and evaluation of potential future upgrades to the GBU-28 hard target penetrator weapon and other legacy weapons.	Force and from \$bined to complet ion of the GBU.	9.8M to \$3.0l e the AOA an 28 5000 lb we apons.	M for the Navy alysis and pret apon in rock; a	r. This reduct bare for follov and perform d	\$3.0M for the Air Force and from \$9.8M to \$3.0M for the Navy. This reduction eliminated ongoing parameter y funding was combined to complete the AOA analysis and prepare for follow-on program. FY 2000 funding testing and evaluation of the GBU-28 5000 lb weapon in rock; and perform design analysis and evaluation of effrator weapon and other legacy weapons.	ing parameter 2000 funding valuation of
	Schedule: The AOA was extended to evaluate additional concepts and conduct a survivability analysis. The AOA was completed in 4Q FY 1999	duct a survivabil	ity analysis. 🤈	The AOA was	completed in	4Q FY 1999	
9	D. Other Program Funding Summary (\$ in Thousands)  EY 1999  EY 2000  EY 2001  Actual  Estimate  Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
9	Not Applicable						
<u> </u>	E. Acquisition Strategy The contract to perform the AOA work was a modification to an existing Systems Engineering and Technical Assistance (SETA) support contract to the Ogden Air Logistics Center (OO-ALC) ICBM System Program Office (SPO) - a Cost Plus Award Fee (CPAF) contract filled by TRW (Colorado Springs). Hardened Target Munitions Program alternatives were fully evaluated in the AOA. At the conclusion of the AOA, the Air Force had the necessary information to support the GBU-28 5000 lb weapon as the most cost-effective alternative to defeat hard and deeply buried targets and to conduct investigations into improvements of the GBU-28 and other legacy weapons.	ystems Engineeri Plus Award Fee onclusion of the A aply buried target	ing and Techn (CPAF) contri 4OA, the Air is and to condi	ical Assistance act filled by Tl Force had the 1 uct investigatic	e (SETA) sup RW (Colorado necessary info ons into impro	port contract to the obtained or Springs). Hardene ormation to support overments of the GB	Ogden Air ad Target the GBU-28 U-28 and other
9	F. Schedule Profile	EY 1999		EY 2	EY 2000	EX	EY 2001
<u> </u>	Complete AOA	2 3	4 * *	1 2	8	1 2	٤. 4
3333	Publish AOA Report Conduct Testing in Rock Brief Rock Test Results				××	×	
	Project 644641	Page 3 of 6 Pages				Exhibit R-2 (PE 0604327F)	E 0604327F)

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)	SHEET (R	-2 Exhib	it)	DATE		February 2000	
BUDGET ACTIVITY  04 - Demonstration and Validation	PE NUMBER AND TITLE 0604327F Harde	⊳ τιτ∟ε <b>Hardened</b>	PE NUMBER AND TITLE 0604327F Hardened Target Munitions	itions		PRC <b>64</b>	PROJECT <b>644641</b>
(U) E. Schedule Profile Continued	FY 1999 2 3	4	EY 2000 2 3	4	1	EY 2001 2 3	4
* = Completed event  X = Planned event					ı		
Project 644641	Page 4 of 6 Pages				Exhibit F	Exhibit R-2 (PE 0604327F)	327F)

BUDGET ACTIVITY	RDT&E PROGRAM ELEMENT/PROJECT	RAM ELE	MENT/PR	OJECT CO	OST BE	COST BREAKDOWN (R-3)	VN (R-3)		DATE Fe	February 2000	00
24 - 40	BUDGET ACTIVITY  04 - Demonstration and Validation	/alidation			PE NUMBER AN <b>0604327F</b>	PE NUMBER AND TITLE 0604327F Harden	אס דודר ב Hardened Target Munitions	Munition	S	id 9	РRОЈЕСТ <b>644641</b>
(U) A.I	A. Project Cost Breakdown (\$ in Thousands)	(\$ in Thousand	(S)				FY 1999	666	FY 2000	0	FY 2001
, ,	<b>A</b>						)	1,083	1,100		0
(C) Fiel (C) SET	Field Agency and Contractor Support SETA Contractor	Support					I	1,383	9/0 480		0
	GBU-28 Test Assets GBU-28 T&E						2,5	2.466	240 2,050 4,840		0
	B. Budget Acquisition History and Planning Information (\$\mathcal{S}\$ in Thousands)	ory and Plannin	g Information	(\$ in Thousand	ଜ						
(U) Per	Performing Organizations:										
	Contractor or	Contract									
Gos	Government	Method/Type	Award or Obligation	Performing Activity	Project Office	Total Prior	Rudoet	Budget	Budget	Budget to	Total
Acti	Activity	Vehicle	Date	EAC	EAC	to FY 1999	FY 1999	EY 2000	FY 2001	Complete	Program
Prox	Product Development Organizations	izations									
SEI	SETA Contractor	SS/CPAF	Oct 99	480	480	0	0	480	0	0	480
TR	TRW (CO Spgs)	SS/CPAF	Oct 96	8,894	8,894	2,068	1,083	1,100	0	0	4,251
Not	Note: EAC estimate by Performing Activity and Project Office includes FY96 and FY97 funds from PE 0603311F	orming Activity	and Project Off	ice includes FY9	6 and FY97	funds from PI	E 0603311F.				
din S	Support and Management Organizations	ganizations	,		1	•	,		(	ć	
TR	TRW (McLean, VA)	SS/CPAF	Dec 98	N/A	N/A	0 ;	225	400	0	O (	\$79
AF	AFMC/OAS Kirtland AFB	MIPR	Dec 97	N/A	N/A	20	10	10	0	0 (	40
SM	SMC/TE (Kirtland)	MIPR	Oct 97	<b>4</b> /Z	N/A	943	172	0	0	0 0	1,115
A F	ASC/YG (Eglin)  Test and Evaluation Organizations	MIPK	Oct 9/	N/A	K/Z	1,118	9/6	000	>	>	7,074
SM	VSMR (White Sands)	MIPR	Oct 99	A/X	N/A	0	0	1,350	0	0	1,350
F-1.	F-15 Support (Eglin)	MIPR	Oct 99	N/A	N/A	0	0	700	0	0	700
Proje	Project 644641			Pag	Page 5 of 6 Pages	ses			Exhibi	Exhibit R-3 (PE 0604327F)	04327F)

RDT&E PROGRAM ELEMENT	SRAM ELE		I/PROJECT	COST BREAKDOWN (R-3)	DOWN (	R-3)		DATE <b>Fel</b>	February 2000	00
BUDGET ACTIVITY  04 - Demonstration and Validation	/alidation			PE NUMBER AND TITLE 0604327F Hardened Target Munitions	TTLE ardened T	arget N	lunitions		à Ý	РВОЈЕСТ <b>644641</b>
(U) Government Furnished Property:  Control  Metho  Item  Description  Product Development Property  N/A  Support and Management Property  Test and Evaluation Property	perty: Contract Method/Type or Funding Vehicle ty N/A operty	Award or Obligation Date	<u>Delivery</u> Date	Total Prior to FY 1999	Ħ		Budget FY 2000	Budget FY 2001	Budget to Complete	<u>Total</u> Program
Subtotals Subtotal Product Development Subtotal Support and Management Subtotal Test and Evaluation Total Project	nt ement			Total Prior to FY 1999 2,068 2,081 0 0 4,149	<b>- 김</b>		Budget 1,580 1,210 2,050 4,840	Budget FY 2001 0 0 0 0 0	Budget to Complete 0 0 0 0 0	Total Program 4,731 4,674 2,050 11,455
Project 644641			]	Page 6 of 6 Pages				Exhibi	Exhibit R-3 (PE 0604327F)	04327F)